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The October number of the Ophthalmic Record will contain, among others, an original article by Norburne B. Jenkins, M.D., "Emmetropia or Corrected Ametropia;" one by Frank W. Miller, M.D., "A Case of Parinaud's Conjunctivitis;" one by Robert Sattler, M.D., "The Surgical Treatment of High Myopia." There will appear Editorials, Society Reports and Miscellaneous Items of Interest.

The Record particularly desires short practical papers on any subject connected with Ophthalmology. These will be published at as early a date as possible. It is understood that, unless otherwise arranged, original articles when accepted are contributed to the Record exclusively. Illustrative cuts will be made at the expense of the journal and proofs for correction will be sent to authors when desired. Reprints with covers are furnished at cost. One hundred of these will be presented to authors *gratis* when a request for them is written on the original manuscript. The Record will be issued monthly and each number will contain about 54 pages of reading matter.

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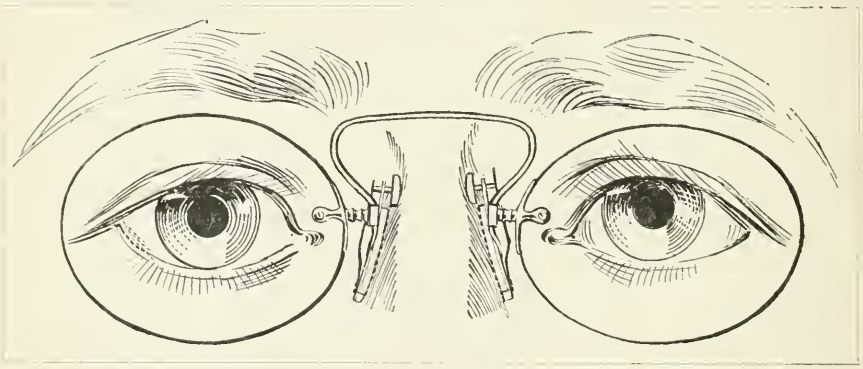

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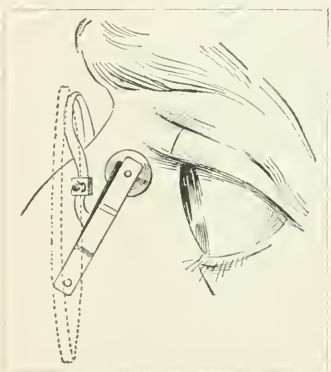

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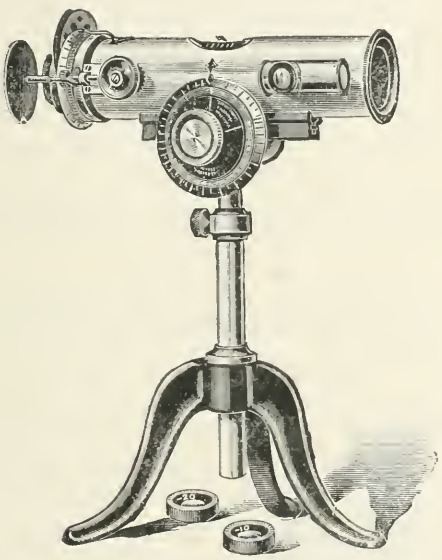

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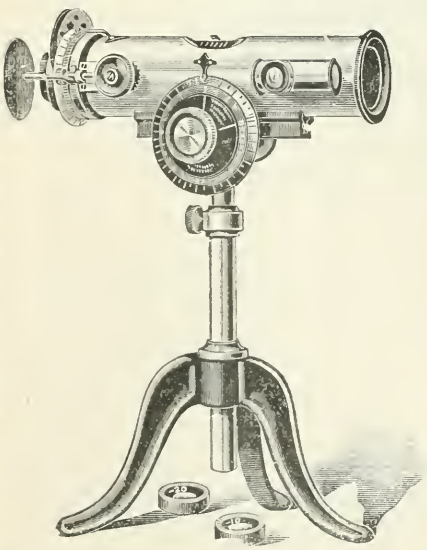

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THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, SEPTEMBER, 1898. No. 8. NEW SERIES

ORIGINAL ARTICLES.

CORNEAL ULCERS, VARIETIES AND TREATMENT, WITH SPECIAL REFERENCE TO SUB-CONJUNCTIVAL INJECTIONS.*

BY JOSEPH E. WILLETTS, M.D.

PITTSBURG, PA.

The subject of corneal ulcers is such a common one that it scarcely seems worthy of the consideration of this society, yet there are many interesting details in the differentiation of not only the varieties, but also the treatment, which are extremely important when we recognize the irreparable damage they are capable of rendering to the organs of vision. The distinctive differences in the character and appearances of corneal ulcers is pronounced. However, it is not the intention to enter into the characteristic details of the various forms, since it is the design of the paper to deal more especially with the present method of treatment by subconjunctival injection, and, for the sake of brevity and convenience, other forms of keratitis, such as: phlyctenular, punctata, onyx, etc., will be spoken of as in the same category.

All forms of corneal ulceration are dependent, more or less, on infection. Evidence has been collected which shows that the pneumococcus of Friedländer is capable of producing grave ulcerative conditions of the eye, and that the pneumococcus of Fränkell has been observed as the pathogenic micro-organism in cases of tenonitis, panophthalmitis, hypopyon keratitis, conjunctivitis, and probably in some forms of dacryocystitis.

* Read before the Pennsylvania State Medical Society at Lancaster, Pa.

Nuel says that keratitis punctata and analogous forms are diseases of special microbes that are absolutely typical.

In the treatment of corneal ulcers, atropia is looked upon as almost a specific, when in reality it is only a preliminary step. It has no germicidal action, and has no bearing on the cure of the disease, excepting that of preparing the parts for reparative action. It paralyzes the accommodation, doing for the eye what a splint does for a fracture, puts the part in absolute rest, which is a recognized factor in the successful treatment of all disease. It relieves the local congestion, which, however, is a symptom only, and seems to me to have a special action on some varieties that is not applied to others. In phlyctenular keratitis, which is not dependent on micro-organisms, while atropia is not contra-indicated, it certainly is not indicated, and the patient may be spared the annoyance dependent on its use. This disease, principally one of childhood, is characterized by elevations of the corneal epithelium at the limbus, dependent on the congregation of leukocytes at the peripheral nerve endings. It is readily cured by the yellow oxide of suitable strength, together with supportive treatment, in those cases of scrofulous diathesis, or cachexia, from unhygienic surroundings. Analogous to this form is keratitis fasicularis, which, like the former, commences at the margin of the cornea, but this, unlike the former, invades the cornea, generally in a parallel line, dragging after it a leash of blood-vessels, the arrangement of which is pathognomic of this affection. It yields readily to the same treatment. The serpiginous ulcers with hypopyon and other forms of corneal infection such as onyx, require a more radical and prolonged treatment, the benefits of the actual cautery in these infections are infinitely superior to any other method. I have never seen a single bad effect from its use, and have used it when the condition of the conjunctival sac would seem to contra-indicate it. It is decidedly preferable to the Sæmisch operation, which only relieves the tension at the expense of a new traumatism: the evacuation of the hypopyon being not essential, since its absorption is assured under proper treatment. The cautery at a red heat should be applied to the underlying edges of the ulcer, and in case of onyx, penetrate it deeply, experience having taught me that the floor of the ulcer will undergo resolution with a thorough cleansing, or slight curettement. The cautery is a direct, immediate stimulant, and destroys the microbic area with which it comes in contact, instead of creating a new condition favorable for infection, as the Sæmisch operation does. All of these cases need atropia, hot water and the systematic influence of mercury. The latter may be accomplished by any method

consistent with scientific medicine. Lagrange and Formaget (1) have employed mercuric cyanid by subconjunctival injection in the treatment of panophthalmitis. Chavellereau (2,) in the treatment of vitreous opacities, and Dunn (3,) in hypopon keratitis. E. H. Bernst (4,) prefers mercuric cyanid to bichlorid, claiming for it a quicker and more complete absorption. He is in favor of the method. De Schwienitz, Baker, and Roy (5,) concur in his opinion, while Stirling, Reynolds, and Savage (6,) have had unfavorable experiences with this method. Fernandez (7,) reports encouraging results in the treatment of trachoma, by the subconjunctival injection of the permanganate of potassium. An injection of 1 per cent. solution of cocain is first given, followed in about twenty minutes by an injection of from one-half to one gramme of a one to one-thousand strength solution of permanganate of potassium. The eyes are washed daily with an antiseptic solution, and in about eight days (or after the swelling has subsided), the injection is repeated. Mellinger and Bossaline (8,) introduced India ink beneath the conjunctivæ of rabbits, and demonstrated beyond cavil that fluids so introduced follow the greater lymph channels and surround the entire globe. The amount of ink actually entering the eyeball being small in comparison to the amount injected. They believe that the fluids also connect with the supra-choroidal and intervaginal spaces of the optic nerve.

Abadie (9,) repeats his injunctions against bichlorid solutions, especially when iodoform is used contemporaneously in purulent ophthalmia, on account of its evil effects on the cornea. Gallezowski (10,) has abandoned the method, and Ray feels that he cannot depend on them exclusively.

The progress of medicine is not so much dependent on new discoveries as it is on the careful sifting of the evidence at hand and the elimination of its errors. Its gain has been one of principle at the expense of superstition, and to-day it is an exact science. The theory of subconjunctival injections must be an error, since it is incompatible with the first teachings of not only hyperdermatic medication, but all medicine. Mellinger and Bossalino's illustrated experiments, showing a section of an enucleated eye, in which India ink had been injected during life, and which shows the ink in the eye and surroundings, is interesting only because it shows the channels traversed, for it has no bearing on the efficacy of the method. That it was found in the eye and optic sheath should not occasion so much surprise, as its absence in these parts would, since we know that were it not an inert, insoluble product, it would be found in every organ of the body.

Hyperdermatic medication is too well established — too frequently used — and the effect too palpable to doubt its immediate penetration of every organ of the body. It was for this that it was adapted and adopted. Its earliest promoter, Ruppaner (11), makes no claim in his treatise for especial benefit of the tissues at the site of injection. On the contrary, he speaks of the possibility of abscess in that region. We know that there is a disturbance of the relation of the cellular tissues at this point; that the solution injected is an irritant; that the traumatism causes an increased leukocytosis, which are all favorable to the production of abscess even in a healthy tissue. Photophobia, lachrymation, congestion, and pain are the predominant symptoms in corneal ulcer. The congestion is in direct ratio to the virulency of the infection. If this be great, the congestion in all the orbital tissue is great. There is no clinical data, no evidence, no law in medicine, that teaches us to select an already congested area for the introduction of an irritant, thereby accentuating the conditions instead of benefiting them. Conclusions are:

(1) That the rationale of the treatment of corneal ulcers by subconjunctival injections is extremely questionable.

(2) That the results are no better than if the injection be given in another part of the body.

(3) That the eye not injected receives as much medication as the injected one.

(4) That it accentuates already abnormal existing conditions.

(5) That it adds a new traumatism to an old inflammation.

(6) That it has a tendency to promote suppuration, to say nothing of thrombi.

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THE DETECTION OF UNSUSPECTED CORNEAL CHANGES BY EXAMINATION WITH STRONG LENSES AND FOCAL ILLUMINATION.

BY H. GRADLE, M.D.

CHICAGO.

It is the object of this paper to point out that by the use of a magnifying lens combined with focal illumination anomalies of corneal transparency may be found in certain instances, in which such lesions are neither suggested by the history, nor revealed by any other mode of examination. The method employed is the familiar one of lateral illumination in the dark room; as a magnifier I use a Coddington or other strong lens-combination of about ½ to ¾-inch focus. A ¾-inch objective can be used, but it is not a convenient form. It is well to focus the image of the flame exactly upon the corneal surface. The turbidity of the normal cornea is resolved by this examination into a faintly granular appearance with scarcely discernible grain. I would ascribe this appearance to the corneal lymph-spaces, in which the corneal corpuscles are situated. For on examining a microscopic slide of gold or silver-stained corneal lamellæ with the lens used for clinical work the corpuscles are barely recognizable as minute grains.

It is evident on physical consideration that the normal turbidity of the cornea may be much exaggerated without being manifest on direct or ophthalmoscopic inspection. For if not circumscribed it would not show as a shadow in the ophthalmoscopic view, but would merely dim the contours visible in the fundus. On direct inspection a diffuse corneal cloudiness would not be detected unless sufficiently pronounced to make the pupil gray. If at the same time the lustre of the surface is normal, the exaggerated corneal turbidity can only be found on using lateral illumination. Even with this aid, I find it is difficult to decide whether we have normal or slightly exaggerated turbidity—unless the flame-image on the cornea or in its substance is viewed with a lens magnifying six or eight times, and permitting a close approach. If the flame-image be projected against the dark pupil it is not difficult to tell with the lens, whether the turbidity is normal or intensified, after some

practice on normal eyes. The distinction is facilitated by the fact that the more turbid the cornea, the coarser appears its grain.

Yet a diffuse turbidity, which the observer cannot recognize with the ophthalmoscope may reduce vision appreciably, since the retina itself is much more sensitive to the blurring of images formed upon it, than is the observer who views the retinal image through the ophthalmoscope.

I can classify the unexpected changes revealed by this method under three heads.

1. After *extraction* of *senile cataract* I have found often very much increase of corneal turbidity, beginning at the wound cicatrix and extending—sometimes throughout the entire cornea—while in other instances it diminished to about the normal transparency in the corneal center. Although I had previously noticed this turbidity, I have examined for it more systematically and recorded it only in the last eight eyes that have presented themselves. This study has shown me that imperfect vision after cataract extraction may depend partly on the turbid condition of the cornea, even when it is not recognizable by any other method of examination. In these eight eyes increased turbidity was found five times, and in none of these was the sight quite as good as might be expected from the condition of the pupil. *Indeed there seemed to be some proportion between the visual deficiency and the degree of corneal cloudiness.* The corneal cloudiness was seen when the eyes were first examined within about one week after operation, and did not change during the four to six weeks of subsequent observation. I do not know whether it diminishes in favorable cases, but I have seen it in eyes operated several years previously. In none of these instances was any corneal cloudiness observable by other methods but lateral illumination. In this series there happened to be no striped keratitis, nor any other condition that could be called keratitis. None of the eyes were irritable at the time of last examination. No sublimate solution had been used for irrigation in the operations performed by myself.

Table showing the relation of corneal turpidity to acuity of sight after cataract extraction. (Fundus normal in all cases.) Table on next page.

2. A second instance of corneal turbidity revealed only by this method I have described at the meeting of the American Medical Association in 1898 (to be published in the Journal of the American Medical Association.) It was observed in patients complaining of asthenopic symptoms with, however, more burning or smarting, and a tendency to increased vascularity, than is usually found in connection with refractive errors. Moreover, glasses, although useful in almost all the instances,

Time Since Operation.	Form of Operation.	Condition of Pupil.	V. After Full Correction.	Condition of Cornea.
Mr. M. 7 years, operated by another surgeon.	Simple extraction, later on iridectomy for occluded pupil.	Clean central pupil, fringe of thickened capsule at periphery of pupil.	20/30	Normal.
Mrs. W. 6 weeks.	Peripheral extraction with iridectomy.	A single shred of gray capsule in black pupil.	20/40	Normal.
Mr. Bd. 8 months.	Simple extraction; secondary discission.	Very delicate capsule, with small central rent made by discission.	20/50	Slightly increased turbidity next to cicatrix, but about normal in centre.
Mr. Be. R. E. 2½ years	Extraction with iridectomy.	A few shreds of faintly grayish capsule in black pupil.	20/100	Decidedly increased turbidity.
L. E. 8 weeks.	Extraction with iridectomy.	About the same as in R. E.	20/70	Turbidity distinctly more than normal, but less marked than in R. E.
Mr. St. 4 weeks.	Extraction with iridectomy.	Puckered remnants of capsule, not grayish, scarcely visible with ophthalmoscope; large, clean, central rent.	20/150	Decidedly turbid, perhaps more than any other in this series.
Mrs. C. 3 weeks.	Extraction with iridectomy.	Black, central pupil; but fringe of thickened capsule at edge of pupil.	20/80	Cornea more turbid than in non-operated eye.
Mrs. E. 2½ years, operated by another.	Extraction with iridectomy.	Puckered, and slightly thickened capsule throughout pupil, but centre of pupil quite clear optically.	20/200	Uniformly increased turbidity, when compared with non-operated eye.

gave neither complete, nor absolutely prompt relief. The vision was in all these eyes a trifle below normal after the utmost optic correction, and it was noticeable how undecided the patients were in their answers during refractive tests. The objective appearances were unmistakable in two strictly one-sided instances, viz., slight ptosis from increased vascularity of the lid, distension of the scleral veins next to the retrotarsal folds, and distinctly increased corneal turbidity, with "coarser grain," as compared with the other side. In three other instances, in which the disease was not one-sided, but more pronounced in one eye than in the other, it was also easy to satisfy oneself as regards the presence of the objective symptoms. When the irritation involves both eyes alike, the diagnosis is more difficult. The congestive ptosis is so slight that it is only detected when one-sided, the slight scleral vascularity is not characteristic, and the corneal turbidity, if equal in both eyes, can be called morbid only in well defined instances. Still, the writer has seen at least six other patients within less than two years, who complained of irritative symptoms not wholly accounted for by refractive errors, and whom he would classify under this head. In three of them the corneal turbidity was pronounced enough to be morbid beyond question. In the three other cases the diagnosis might have been in doubt. Some of these patients had slight inflammatory thickening of the conjunctiva of the superior transition fold. In others it was absent. The condition of the cornea cannot be considered a keratitis, but rather as an irritative lesion of uncertain localization, with disturbance of the lymph currents in the cornea. Most of the patients improved both subjectively and objectively, under rest of the eyes, correction of the error present, and the inspersion of calomel.

3. I would finally call attention to a true inflammatory condition of the cornea, which might easily escape detection without this method. It must be well known that occasional small specks of infiltration in the cornea give rise to moderate irritation, but not to any visible ciliary injection. Of course as a rule, these infiltrates may be seen by the naked eye or readily with lateral illumination. Yet I can recall two instances in which very minute inflammatory infiltrates would have been overlooked had I not made use of the strongly magnifying lens with lateral illumination. For even after having recognized them it was very difficult for me to see them with any lens of lower power. Yet the importance of these miniature infiltrates, and the correctness of the diagnosis, was shown by the influence of treatment in removing the barely visible specks in the cornea as well as the irritation they had

caused. The most striking instance, however, of inflammatory lesion revealed only by this method is furnished by the following unique case:

Mrs. S., 22 years of age at the time, began complaining of intense lachrymation during her pregnancy in 1876. The tears flowed so freely that she could not use her eyes for work, though the evening brought some relief. There were no other eye symptoms. She called on various oculists in this city and New York, but obtained no relief, and not even a definite diagnosis. The ducts were found patent on probing. In December, 1881, she came to me, and I still possess her complete record. The watering had now persisted for five years with slight remissions. As the tears flowed freely into the nose, there could be no obstruction in the tear passages. The nose itself was normal, and there were no nasal symptoms. The eyes were pale, but became slightly bloodshot on continued examination. They appeared normal on inspection. The conjunctiva of the lids showed merely congestion. No anomaly was found ophthalmoscopically (direct image). Her sight was only 20/60, and she accepted no glasses. Under Homatropin the refraction was emmetropic, but as Homatropin did not paralyze the accommodation fully, she was placed under Atropia. But with complete cycloplegia she could only accept cyl.—0.5 axis 0 with uncertainty.

I considered the lachrymation as a reflex of unknown origin. I could not account for the low vision by the ophthalmoscopic findings. She staid under observation three months, being treated with Fowler's sol., quinine and other measures intended to act upon the nervous system. There were some variations in the intensity of the watering, but no positive effect could be ascribed to the treatment.

She returned again in 1898 with this history. In 1882 she was treated by a colleague in an adjoining city by applications to the conjunctiva of the lids and the nasal mucous membrane. She was much benefited—practically cured as she says—for about six years, but still was under the necessity of calling on her physician off and on during those six years. The inference that this was a case of reflex from the nose, cured by nasal therapeutics is not borne out by further inquiry. There have never been any nasal symptoms, and there are none now—such as discharge, transitory nasal obstruction or sneezing spells. The interior of the nose is perfectly normal and shows no scars of any cauterization. I am hence of the opinion, that whatever benefit was conferred upon her, was due to the conjunctival application, not because the lids were diseased, but on account of the influence of those remedies (presumably nitrate of silver) upon the cornea.

Within the last ten years the watering has again returned in spells lasting a number of weeks. At first occasional treatment by the same oculist gave some relief; later on, it was either not so satisfactory, or at least not sought so regularly. She has now had more or less continuous watering for many weeks.

On July 12, 1898, I found Mrs. S. in good health and complaining of nothing except the lachrymation. When the eyes water she is somewhat sensitive to light. This shows itself now by deep wrinkles in the forehead, the result of years of frowning. When the watering diminishes she can use her eyes fairly well, but is getting somewhat presbyopic (44 years). At present the watering is much worse on the right side. The conjunctiva shows an insignificant thickening at the upper fornix, otherwise there is only slight congestion and no

catarrhal secretion. The sclera is pale, but on long exposure to light there follows a slight conjunctival blush. No ciliary injection. The ophthalmoscope detects no anomaly, even on focusing upon the cornea with a 10 D lens. Her vision is

R. E. 20/40, with 0.5 ax O or sph.—0.5 (?)=20/30 minus,

L. E. 20/25—no glass.

The clue to all symptoms was found on examining the cornea with the magnifying lens under focal illumination. The right cornea is studded with 12 to 15 well defined specks of sub-epithelial infiltration, which cannot be seen with certainty on using the ordinary lens of the ophthalmoscopic case (about 15 D) but are unmistakable when viewed with the Coddington. The cornea is besides decidedly more turbid than normal. The left cornea shows even more turbidity than the right, but I could only find two single white miniature infiltrates in its substance.

I must hence consider the lachrymation a reflex from the diseased cornea—the disease itself being a circumscribed superficial punctate keratitis of the mildest possible type with no ciliary injection, and yet of a duration of 22 years (though with intermissions). This view is confirmed by the course under treatment.

I ordered calomel inspersion twice daily. As the patient, however, attributed much of her former relief to the conjunctival treatment, I applied a 0.5 per cent. solution of nitrate of silver as a matter of policy, and not because there seemed any good indication for it. She returned, however, the next day decidedly benefited. This improvement, which continued thereafter, I cannot ascribe wholly to the calomel, of which I have never seen so prompt an influence in any form of corneal inflammation. I have observed in other instances of superficial corneal processes decided and prompt improvement on using nitrate of silver for conjunctival indications, and have been led to believe that the influence of the silver upon the cornea is a direct one in certain cases. In the present patient, moreover, the conjunctiva could not be called inflamed. Yet the improvement progressed under the daily application of 2 per cent. solution of silver nitrate to the transition fold. The "dots" in the right cornea became fainter and some disappeared, until on the eighth day a few new ones made their appearance. She noticed, too, more watering, and V tested that day was found barely more than 20/50. The left cornea showed no spots by this time, merely an increased turbidity. On the 15th day all watering had ceased. The spots in the right cornea are now unmistakably fainter, and not nearly so numerous, and the turbidity of the cornea is not much above the normal in either eye. As the conclusive test, however, I wish to emphasize her ability to read 20/20 positively with with either eye.

The case is reported only on account of its diagnostic interest. From a therapeutic point of view it is by no means conclusive, and a relapse may be expected with some certainty.

A CASE OF CONGENITAL NUCLEAR CATARACT.*

J. WINTER WAMSLEY, M.D.

OF PHILADELPHIA.

Opacities of the crystaline lens may occur during fœtal development, or what seems more peculiar, opacities from no apparent cause may develop shortly after birth, in cases where the eyeball and its structures appeared at first to have been perfect. A case of this nature came under my observation in April, 1897.

Wm. K., a boy 14 years of age; at birth no defect in sight was observed, but when about 6 years of age the parents noticed a change in the boys actions and in the movements of his head. He looked sideways, or with his head turned. The family physician, who attended at the birth, was consulted, and advised special attention. He also stated that he had noticed no defect in the eyes at the time of the birth. The parents were the first to notice the change then developing. The patient was taken to a hospital, where operation was advised, and treatment given; no operation was done, probably from the parents' neglect. From that time little was done to relieve the defective vision, the boy not being able to read or distinguish objects. His early schooling was necessarily neglected. He learned, as best he could, from hearing. Three years ago the boy was again taken to one of our eye dispensaries, and two operations were performed on the left eye within a period of three weeks. The patient evidently neglected to stay and complete treatment; the cataracts still remained the same as prior to the operations; there had been no visible absorption of the lens.

The following notes were made when the patient first consulted me for treatment: Horizontal nystagmus of about 2 mm., under ordinary conditions. The number of oscillations seemed to increase if the patient became nervous. No existing inflammation in either eye. Pupils reacted well to light, and light perception and projection were excellent; vision of both eyes about the same; could count fingers at a distance of one foot with difficulty. Homatropine was used to dilate the pupils. In the central and anterior portion of each lens was an opaque spot of about 2 mm.; the peripheral portion of the lens was perfectly clear, and both anterior capsules were transparent, excepting a small place in the left capsule, which had a cicatrix from the original needle operation. It is probable that a single needle operation had been done on both occasions. The opaque spot in the left eye was a little larger than that in the right eye, and also may have been caused by the operation. No portion of the lens matter had been absorbed as a result of the operations. The capsule had apparently healed quickly. The tear in the capsule was not large enough over the sight of the opacity, which being harder than the clear cortical portion, the aqueous fluid

* Read before the Philadelphia County Medical Society, February 23, 1898.

had had less solvent action upon it. With the ophthalmoscope a red reflex was readily seen in both eyes when the pupils were dilated, but not so when the pupils were in their normal state of action. No distinct view of the retina or its blood-vessels could be seen. The patient stated that he could see better at night than during the day, and also in a subdued light than in an intense light or average daylight. This fact was due to the dilation of the pupils, allowing the light to pass through the outer clear portion of the lens, thus enabling him to see his best. Under ordinary circumstances, when the pupils were contracted from light stimulus, the pupils closed around the central opacities, and consequently let in a smaller amount of light, none going through the nuclear portion of the lens. As well as could be ascertained, the family history was good; no specific, rheumatic, or nervous disorders in any member of the family. The patient has been healthy from infancy. In April I again advised operation, which was done on the 25th.

As a preliminary, mixed treatment was given one week previous to the operation; two days before it a mydriatic composed of atropin sulphate 2 grains to one fluid ounce of water, was instilled into the left eye three times daily, and on the day prior to the operation the patient had a hot bath and a saline laxative. Cocain, in 4 per cent. solution, was used for local anæsthesia, the eyelids were separated by an ophthalmostat, the pupils were well dilated, and the eyeball was held at the corneo-scleral margin by an assistant. Double discission was performed, two needles being used, and each needle passed in at opposite sides of the cornea. The points of the needles were made to meet in the center of the lens, and using the cornea as a fulcrum, the two handles of the needles were brought together. The lens was thus forced apart, splitting completely in half. Care must be taken in doing a discission, not to use too much pressure on the needles, as it would likely force the lens from its delicate peripheral attachment, and cause it to drop into the vitreous. Immediately upon the lens being broken the needles were withdrawn. The aqueous humor then came in contact with the free split edges of the lens. A small amount of aqueous fluid also escaped through the vent made by the needles.

The conjunctival sac was then irrigated, atropin instilled and a slight pressure bandage applied. In a few hours the bandage was removed, and as a precautionary measure to prevent any undue inflammatory action that might arise from the operation, cold compresses were used one hour at a time in every three hours. The atropia was continued, it being used every six hours for the first forty-eight hours. Twenty-four hours after the operation showed that the aqueous was taking effect on the lens substance by the cloudiness developing in the lens.

A little pericorneal injection followed and did not pass off entirely until the greater portion of the lens had been absorbed, nearly four months after. After the first few days the ice compresses were discontinued, but the instillations of atropin were continued for twice a day for over four months; no disagreeable effects were experienced from its continued use, such as dryness of the throat and irritation of the conjunctiva, which often occur from long and continued use of the drug; no pain was present at any time, only a little soreness within the few hours after operation. The patient was seen about once a week. A few days after the operation, when any developing complication was thought to be well

out of danger, the patient was instructed to wear dark glasses and permitted to go out. About two months later, while absorption was going on, the nucleus or the central opaque spot separated from the larger remaining portion of the lens, and dropping forward into the anterior chamber, lay in the bottom and in front of the iris. It caused no irritation, and remained until the whole of the lens had been absorbed. Its slower solution was probably due to a calcareous or fibrous state. Nearly six months was required to dissolve the lens in its entirety. No extra needling was necessary, as the lens was well softened and absorption was going on as fast as nature would permit. On the 14th of October the posteror capsule was cut with Hunter's knife-needle; the capsule was opaque and tough; apparently it had acquired this condition from the original operation of splitting the lens and also from the swelling lens substance. The knife-needle was passed in through the lower and outer quadrant of the cornea, and the capsule thoroughly divided longitudinally with a sawing or cutting motion. Care was taken not to use too much traction on the capsule, or cause undue drawing upon the ciliary bodies—neglect of this endangers the good results of capsulotomies. The eyes were again bandaged for one or two days, it being removed occasionally for instillations of atropin; no reaction followed the operation, and the use of atropin was discontinued. The opening thus made in the capsule allowed the light to pass through to the fundus to the fovea centralis, which had long been in disuse. After the capsulotomy, the fundus was examined with the ophthalmoscope; the retina, nerve, blood vessels, and vitreous were perfectly normal; no trace whatever of a remaining fibro-vascular sheath to the lens.

The patient was refracted by retinoscopy, a plus 13 diopter glass being used. As soon as the glass was put on the patient was able to count fingers at two yards with accuracy, and also by looking directly at the object. Whereas, before the patient had to look sideways in order to get the best view possible, the light coming through the peripheral portion of the lens. The vision at the present time is 20–150. This amount of vision is far from normal, and better vision might be expected after all difficulties had been removed. The defficiency is readily explained by an amblyopic condition of the retina due to disuse. The patient was given glasses in the early part of November last, and since that time has been wearing them constantly, with continued improvement, the rays of light falling directly on the fovea. The nystagmus has greatly lessened in the number of oscillations of the eyeball, and a more pleasant and intelligent expression has developed. The remaining cataract in the right eye has not yet been operated upon, but operation will probably be begun in the near future. While the patient has gained distinct and direct vision from the operations, he will not be able to judge distance until he has the conjoint use of both his eyes.

The question arises as to the cause of the lenticular opacities in these peculiar cases. With the best possible history of the case from infancy, no indication whatever could be found that could, in reason, be the apparent cause of the cataracts. There had been no fœtal iritis, or, if it had occurred, it has left no trace of the disease either on the margin of the iris, or any mark on the anterior capsule over the sight of the opacity.

It seems to me that there might have been a tissue change from some condition of the lenticular nerve fibres, which in turn caused a degeneration of certain lens fibers. I see no reason why such a process could not cause such a change in the lens of the eye, in the same way as is often found in other tissues and portions of the body. These cases of congenital cataract give excellent results following operation, providing all the other structures of the eyeball are normal. The sooner the operation is done the better will be the result in gaining acute vision, by a stimulation and development of the central retinal cells and the wearing of proper glasses.

A REFLECTING TROPOMETER BASED ON TRIGONOMETRICAL MEASUREMENTS — PRELIMINARY COMMUNICATION.

BY F. B. EATON, M. D.

SAN FRANCISCO, CAL.

(Illustrated.)

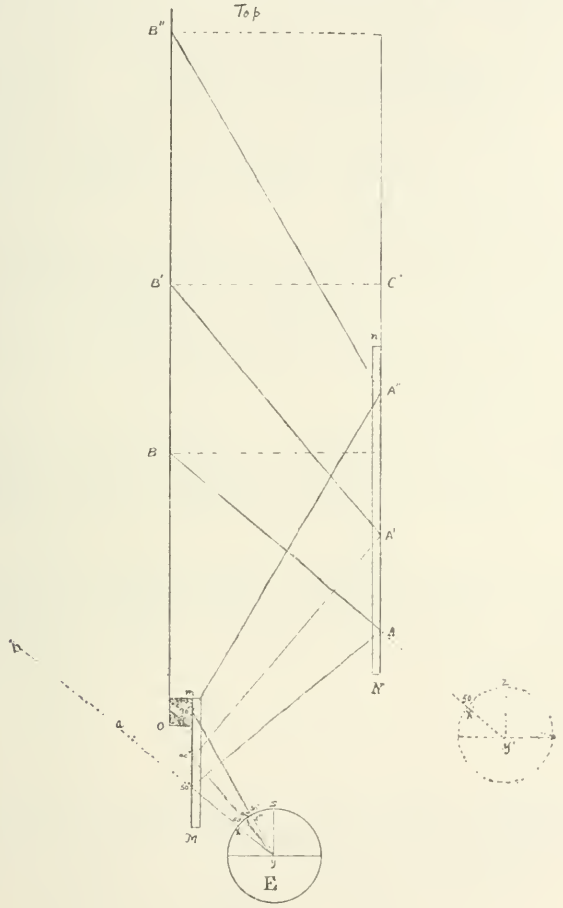
Tropometry, although not new, has attained but lately a recognized position as one of the steps of an ophthalmic examination. Various methods and different forms of apparatus have been employed to estimate the field of monocular fixation, the most used being the perimeter, but of all forms the tropometer of Stevens best fulfills all the conditions. It can, however, only be used as an objective test, and this with all its advantages has some drawbacks, while a distinct limitation is its price. These considerations have led me to devise an apparatus, the essential features of which are alone illustrated in the cut. It is, as far as I know, original with myself, and after all is but the application of well-known principles of trigonometry. It can be used to test the rotations in any direction, either objectively or subjectively, and a model is now in continuous use in my office, having proved practical and useful.

In the cut E is (say) the right eye, the visual axis of which in the primary position is parallel (not necessarily co-incident), with the long axis of the instrument. M m and N n are mirrors placed exactly parallel to each other; B B″ is a test-scale carrying figures, syllables or letters, its surface also being exactly parallel to N n.

M m, N n, and B B″ are movable along the length of the instrument, and lines are ruled through the silvering of the mirrors at several points.

When in use to measure, say, the inward rotation of the right eye sub-

jectively, the narrow proximal end of the mirror M m is placed so as to barely touch the inner canthus, and by means of spider lines the long axis of the instrument is adjusted parallel to the line of vision when the eye is in the primary position*. The patient is then told to look at the figures on the scale B B″ as seen in the mirror M m. The figure at B,



for instance, appears to the inner (left) side of the figure at B′. Suppose the farthest figure to the left which the eye can fix is at B; the mirror N n is then moved so that one of its bright lines is seen to cover the image of the point B; it will then be at A. To the patient the images of A and B will be seen projected in the direction of the dotted line y a b.

*The usual means are employed to fix the head firmly.

We now have the right-angled triangle A C B, of which the sides B C and A C are readily measured, and as

$$\text{Tang. } A = \frac{BC}{AC}$$

by means of a table of natural tangents we can readily ascertain the value of the angle B A C. But B A C=x y z, which is the angle sought+.

Similarly in the triangles A′ C′ B′ and A″ C″ B″ the angles B′ A′ C′ and B″ A″ C″, respectively equal to the angles x y z and x y z, can be measured. As B C, B′ C′ and B″ C″ are constant every variation in the length of A C, A′ C′ and A″ C″ gives a certain angle. These having been tabulated and the table attached to the instrument, no calculation has to be made by the surgeon.

To measure the same rotation objectively, the surgeon has but to observe a point *X* (center of the pupil) on the eye-ball, by placing his eye at or near the point B. He then brings the bright line A on the mirror N n over the line on the mirror M m, by moving the mirrors, when he will see the points A and X in the direction A x′ y′, and can measure the angle B A C as before.

In order to avoid the blurring of the test figures when the test is made subjectively, the instrument is of such size as to make the actual distance from the eye to the test scale considerable, thus also adding to its accuracy.

The principal excellence of this apparatus, and its main advantage over other forms, lies in the ability to measure with it the actual rotation of the eye where otherwise the nose, brow or cheek obstructs the line of vision.

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HOMONYMOUS TORSION—A POSITION OF THE RETINAL MERIDIANS HERETOFORE UNRECOGNIZED.

BY EDWARD P. BREWER, M.D., PH.D.,

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The study of the retinal meridians with my torsiometer [*Vide* OPHTHALMIC RECORD, May, 1898] has demonstrated great variability in their positions when the eyes are at rest and the point of regard infinity in a

+In the drawing from which the cut was made BC=56mn, and AC=46mn. According to the above equation, therefore, Tang. A=1.19175 which is the tangent of 50°.

horizontal line. Among the cases in which the meridians were parallel there is a class, heretofore undescribed, which have an important bearing upon the study of the horopter and the normal position of the "apparent vertical meridians" of Hemholtz and the "longitudinal sections" of Hering, which I shall term the vertical meridians. Assuming the vertical meridians to be normally exactly vertical and parallel with the point of regard at a finite distance in the median plane, the vertical horopter consists of a cylinder perpendicular to the plane of the regard, whose section is a circle through the fixation point and the nodal points giving the horopter circle of Müller. Identical points of the retina are then correspondent and a unity of impression is produced. Such is the operative result of coördinating meridians and is the concomitant of binocular vision with unity of impression. This assumption demands simply that the image be received on identical points and a definite relationship of the meridians be maintained. It therefore appears possible for them to incline to the right or to the left without disturbing binocular vision, since the image will still be received upon identical retinal points. The horopter being practically unchanged at all points of fixation. The recognition of this simple truth has long been delayed, mainly through the dominants of the teachings of Hemholtz and his followers. Proceeding on these premises he constructed an horopter of convergence and mathematically demonstrated that the vertical horopter becomes a cone whose vertex is the point in which the axes of planes of the vertical meridians intersect and whose intersection of the visual plane is the circle of Müller.

By the aid of my torsiometer I have found a large number of cases showing homonymous declination of the vertical meridians both to the right and to the left. In a few the declination was considerable, amounting to several degrees; yet in all there was perfect coördination, a complete sense of location and an undisturbed unity of impression. This condition I have termed *homonymous torsion;* if the declination be upward and to the right it is *right homonymous torsion;* and if upward and to the left, *left homonymous torsion.* The following illustrative cases are, I believe, the first to be recorded:

Case I. Mrs. O. W. aged 42. R. V.=$\frac{15}{40}$ with—1.25 D. cyl. ax. 45=$\frac{15}{15}$-L. V.=$\frac{15}{40}$ with—2 D. cyl. ax. 170°=$\frac{15}{15}$—Javal Ophthalmometer R. 1.50 ax. 120° L. 2 D. ax. 90° abduction 8°. Measurements in degrees of arc with Stevens' tropometer R. up 32°, down 55°, in 55°, out 55°. L. up 30°, down 60°, in 70°, out 60°. Torsiometer measurements indicating the torsional power. *Right vertical meridians+6° of arc left meridian vertical, right vertical meridian—2° of arc left meridian

vertical. Left vertical meridian+7° of arc left meridian vertical. Left vertical meridian—2° of arc left meridian vertical.

The position of the vertical meridians when the eyes were disassociated by a prism and adjusted to a seemingly erect and a parallel position was upward and inward for the right eye and upward and outward for the left eye, each having a declination of six degrees. This condition of left homonymous torsion I express as follows: R. V. M.—6°⊃L. V. M.+6°. Repeated and control tests made as described in the articles before referred, gave uniform results.

Case II. H. O. L. aged 13. R. V.=$\frac{1}{15}$—with+0.25 D. cyl. ax. 90°=$\frac{1}{15}$ L. V.=$\frac{1}{15}$—with+0.25 D. cyl. ax. 90°=$\frac{1}{15}$+. Javal Ophthalmometer R. o. 50 D. ax. 90° L. 0.50 D. ax. 90° Abduction 5° Sursumduction right 1° left 1° Exophoria 1½° at infinity. O. at occupation distance. Stevens' Tropometer R. up 30°, down 45°, in 50°, out 45°. L. up 30°, down 45°, in 50°, out 50°. Torsiometer R. V. M.+5° L. V. M.+4° R. V. M.—2° L. V. M.—3°. Left homonymous torsion of 4°. The vertical meridians giving the reading R. V. M.—4°⊃L. V. M.+4°.

Case III. S. C. aged 19. R. V.=$\frac{1}{50}$ with—1.50 D.⊃—0.50 D. cyl. ax. 90°=$\frac{1}{15}$ L. V.=$\frac{1}{50}$ with—1.50 D.⊃—0.25 D. cyl. ax. 90°=$\frac{1}{15}$. Javal Ophthalmometer R. 0.25 D. ax. 90° L. 0.50 D. ax. 90° Abduction 8° Sursumduction right 2° left 2° =Esophoria 2° at infinity. O. at occupation distance Tropometer R. up 35°, down 45°, in 60°, out 40°. L. up 33°, down 40°, in 50°, out 50°. Torsiometer R. V. M.+5° L. V. M.+5° R. V. M.—3° L. V. M.—3°. Left homonymous torsion of 3° R. V. M.—3°⊃L. V. M.+4°.

Case IV. Mrs. J. C. aged 37. R. V.=$\frac{15}{200}$ with+1.50 D. cyl. ax. 110°=$\frac{1}{40}$ L. V.=$\frac{1}{15}$ with+0.50 D. cyl. ax. 80°=$\frac{1}{15}$+. Javal Ophthalmometer. R. 4 D. ax. 110° L. 1 D. ax. 80°. Abduction 5° Tropometer R. up 30°, down 43°, in 50°, out 42°. L. up 30°, down 45°, in 50°, out 40°. Torsiometer R. V. M.+2° L. V. M.+2° R. V. M.—3° L. V. M.—4°. Left homonymous torsion of 1° R. V. M.—1°⊃L. V. M.+1°.

Case V. J. H. aged 35. R. V.=$\frac{15}{100}$ with—2 D. cyl ax. 180°=$\frac{1}{15}$ L. V.=$\frac{15}{200}$ with—2 D. cyl. ax. 180°=$\frac{1}{15}$. Abduction 6° Esophoria 2½° at infinity. Exophoria 3° at occupation distance. No hyperphoria. Tropometer R. up 30°, down 40°, in 45°, out 40°. L. up 28°, down 40°, in 45°, out 40°. Left homonymous torsion of 2° R. V. M.—2°⊃L. V. M.+2°.

Case VI. M. W. J. aged 44. R.=$\frac{1}{50}$ with+0.50 D.⊃+0.50 D. cyl. ax. 90°=$\frac{1}{15}$ L.=$\frac{1}{20}$+0.50 D.⊃+0.50 D. cyl. ax. 90°=$\frac{1}{15}$. Javal Ophthalmometer R. 0.75 D. ax. 100° L. 0.50 D. ax. 90° Abduction 8° Left hyperphoria 1½° Tropometer R. up 33°, down 47°, in 55°, out 50°. L. up 33°, down 43°, in 50°, out 50°. Torsiometer R. V. M.+7° L. V. M.+8° R. V. M.—0° L. V. M.—0°. Left homonymous torsion of 3° R. V. M.—3°⊃L. V. M.+3°.

Case VII. T. B. aged 53. R. V.=$\frac{15}{100}$ with+1.50 D.=$\frac{1}{15}$ L. V.=$\frac{1}{15}$ with+1 D.⊃+0.75 D cyl. ax. 90°=$\frac{1}{40}$. Javal Ophthalmometer R. 0.50 D. ax. 180 L. 0.75 D. ax. 180. Abduction 7°, Exophoria 1°, Right hyperphoria ½°. Tropometer R. up 30°, down 50°, in 50°, out 50°. L. up 30°, down 50°, in 50°, out 40°. R. V. M.+5° L. V.

*Hereafter I shall designate the right or left vertical meridian as R. or L. V. M., as the case may be, the complementary meridian being always exactly vertical, unless otherwise stated.

M.+5° R. V. M.—5° L. V. M.—3° Left homonymous torsion of 2° R. V. M.—2° ⊃L. V. M.+2°.

Case VIII. J. D. aged 28. R. V.=$\frac{15}{70}$ with—2.75 D. cyl. ax. 165°=$\frac{15}{40}$ L. V.=$\frac{15}{70}$ with—3.50 D. cyl. ax. 10°=$\frac{15}{40}$. Javal Ophthalmometer R. 3 D. ax. 75° L. 4 D. ax. 100°. Abduction 8°, Exophoria 4°. Tropometer R. up 27°, down 45°, in 50°, out 40°. L. up 25°, down 45°, in 48°, out 40°. Torsiometer R. V. M.+3° L. V. M.+4° R. V. M. —3° L. V. M.—2° Left homonymous torsion of 4° R. V. M.—4°⊃L. V. M.+4°.

Case IX. E. A. T. aged 42. R. V.=$\frac{15}{60}$ with+2 D.=$\frac{15}{16}$ L. V.=$\frac{15}{70}$ with+1.50 D.⊃+1 D. cyl. ax. 70°=$\frac{15}{15}$ Esophoria 2° at infinity, the same at occupation distance. Javal Ophthalmometer R. 0.25 D. ax. 80° L. 1.25 D. ax. 70°. Abduction 8°. Tropometer R. up 32°, down 45°, in 55°, out 50°. L. up 32°, down 45°, in 60° out 50°. Torsiometer R.V. M.+2½° L. V. M.—5°=torsion R.V.M.—2½° L. V. M.—0°. Left homonymous torsion of 2½°, combined with a plus torsion of two degrees in the left eye. The formula expressing the condition and represents the position of meredians when disassociated is as follows: R. V. M.—2½°⊃L. V. M.+5°.

Case X. N. W. I. aged 48. R. V.=$\frac{15}{20}$ with+1 D.=$\frac{15}{15}$ L. V.=$\frac{15}{20}$ with+1 D.=$\frac{15}{15}$. Javal Ophthalmometer R. 0. L. 0.50 ax. 90°. Abduction 3°. Esophoria 3½° Left hyperphoria 1°. Tropometer R. up 32°, down 45°, in 50°, out 40°. L. up 33°, down 45°, in 50°, out 40°. Torsiometer R. V. M.+5° L. V. M.+5°=Torsion R. V. M.—3° L. V. M.—3°. Right homonymous torsion when the vertical meridians were disassociated: R. V. M.+2°⊃L. V. M.—2°

THE

OPHTHALMIC RECORD.

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, SEPTEMBER, 1898. No. 9. NEW SERIES

EDITORIALS.

PATHOLOGY AND SURGERY vs. ETIOLOGY AND THERAPEUTICS.

For many years the American Ophthalmological Society has been giving less and less attention to refraction, and this year, by the "conspiracy of silence," killed it altogether. The program of 1898 was made up of thirty-seven papers, not one of which was upon eye-strain or errors of refraction. In this studied neglect the American Ophthalmological, however, differs but little from other societies, and especially the foreign ones. Sarcomas and other tumors, operations, trachoma—of these we hear without end—but of the infinitely subtle and thousand unsolved problems of nine-tenths of the daily office-work of the oculist scarcely or not at all a word! Why is this? Is it that we have all decided that "the passing of the reflex" is already passed? Are there no such things as eye-strain, reflex neuroses, headache, and so forth? Have we determined all the problems in connection with these things? Is our hullabaloo about the prescribing optician and his sins sincere if we scientifically ignore refraction? Are pathology and diagnosis everything and etiology and prevention nothing? The causes of the indifference and neglect are many and recondite, perhaps, but the facts are none the less greatly to our discredit.

In the first place we are permitting ourselves to drift with the *Zeitgeist*, born of self-interest, which is throttling medicine and exalting surgery. "So soon as the fashionable oculist can afford an assistant, he turns refraction over to him," we overheard recently, and we fear it is too true. Now surgery is the despair of medicine—i. e., so long as disease may be prevented or cured by strictly medical means, the surgeon should not be

called in. But in the hunger for success, eclat, and money, we humor our deluded patients and consciences by talking and writing and busying ourselves with operations. They pay better, and make us more fame. All of which, so far as it is morbid and exaggerated, is neither the science nor the art of medicine.

Another reason is that pathology and ophthalmic surgery are fashionable, and require a comparatively low order of talent. It is a comparatively small thing to do the few operations of ophthalmic surgery, and a tyro can soon learn the trick, but it requires a fine nervous system, keen judgment, and inexhaustible patience to diagnose and treat a complicated case of eye-strain. It is easy and satisfying to make a thousand slides of a hundred diseased and dead organs. After they are made, however, do we always even draw the lessons and make them practical, which might be drawn from these dead tissues of a past disease that killed the forgotten patient? More than this can pathology always, nay, can she generally tell anything of the

> Old unhappy far-off things
> And battles long ago,

the habits and mal-functions that instituted the beginnings of the morbid process? It is, for instance, the conviction of many scientific-minded and careful men that eye-strain has a great deal to do with functional gastric troubles, with anemia, with the origin of cataract, glaucoma, etc.—but would "the visiting inhabitant from Mars" attending our medical gatherings or reviewing their reports suspect the fact? In a recent article in the *Philadelphia Medical Journal* the greatest living specialist in diseases of the stomach, in the paragraph epitomizing the subject of gastric neuroses, never even distantly alludes to their frequent reflex source in eye-strain. Yet articles attesting the frequency and directness of this casual nexus have been published by numerous oculists, and by general physicians of the most scientific and conservative characters.

Many other reasons might be adduced for the shameful neglect of refraction—which we treat as a naughty and dirty boy, we will neither mend nor commend, but whom we keep carefully out of sight of the aristocratic world of Science—with a big S. Not only is such "science" truly unscientific but it is inethical. We directly relieve ten times the suffering every day by refraction that we do by operations, and we prevent one hundred times this amount. In every town and village and farming community one-half the people are suffering from headaches, etc., and bringing on ocular diseases, and to the traveling "Professor," and the prescribing optician, they are consigned by our folly. They

are learning the costly lesson that the Professor is a fraud, and they cannot afford to visit the city; so they continue to suffer and endure.

Doctor Robertson at the recent meeting of the British Medical Association spoke as follows:

> The increased acknowledgment, too, of the importance of our specialty by the profession and the public is exemplified by the very greatly increased numbers of the profession who devote their whole time and energies to the practice of ophthalmic surgery. Thus, forty years ago, in the whole of Scotland there were only two pure ophthalmic surgeons, one residing in Edinburgh and one in Glasgow, whereas now they abound in Edinburgh and Glasgow, while Aberdeen and Dundee also supply representatives. We cannot overlook one cause of this increase, which is the recognition of the prevalence of refractive errors and the necessity of consulting an oculist with regard to them. Thus, forty years ago, the set of test lenses employed by the ophthalmic surgeon was of the most imperfect and primitive character, and it was not at all unusual even for the oculist to recommend the patient to go to the opticians to be fitted with glasses, while the profession in general did not consider it necessary to send such cases to an oculist for advice. Cylindrical lenses were then practically unknown, only being constructed at great cost and with great difficulty to meet some very exceptional case of marked astigmatism, in which the nature of the error and its degree had been worked out by long and patient investigation on the part of the surgeon. The difference in these respects at the present time is patent to you all. With the advent of Donders (whose colleague and successor, Professor Snellen, we welcome among us to-day) a new era dawned, and refractive errors and their consequences rest on a satisfactory scientific basis, and constitute a very large proportion of the cases applying to the oculist for relief.

These are hopeful and encouraging words, coming from the president of a society devoting its entire time also to the consideration of other things than refraction and functional muscle-troubles. We smile, however, at the words "forty years ago," when we remember that two or three years ago the chief optician of London could not make a rimless or a cement bifocal lens, and said that he very rarely was ordered by the oculists to make a cylindrical lens, and, if so, almost never one below a diopter in strength.

REPORTS OF SOCIETIES.

AMERICAN OPHTHALMOLOGICAL SOCIETY.

ABSTRACT REPORT.

New London, July 20, 1898.

The meeting was presided over by Dr. Geo. C. Harlan, of Philadelphia.

Why the Proportion of Blind in the Country Is Greater than in Large Cities.—Dr. Lucien Howe, Buffalo.—"In the twenty-five largest cities of the United States the proportion of blind is, with two exceptions, smaller than in the states in which these cities are situated; or, taking all the cities of over fifty thousand inhabitants, together we find in them about 33 per cent. less blind than the average for the entire country.

"Second, when we examine the different factors in the production of blindness, whether congenital or acquired, or, under the latter class whether due to traumatism, general disease, or to local diseases, we find these factors are all practically the same, or are made equal, in city and country with one exception: namely, ophthalmia of infancy.

"Third, a rather extended inquiry concerning the habitual practice of physicians in country almshouses, in hospitals and elsewhere in the state of New York, indicates that more attention is given to guarding against ophthalmia of infancy in the cities than in the country.

"Fourth, this tendency to the habitual neglect, or habitual use of such prophylaxis tends to make a rapid difference in the distribution of the blind, estimated at possibly 14 to 1. It is at least the most apparent cause of this difference, and probably accounts for the greater part of it.

"Fifth, it follows from this apparently warrantable conclusion that if as great care were taken in general throughout the country as is given on the average in the cities to such prophylaxis the number of blind in the United States would be decreased in a single generation by some few thousands.

"While it is neither advisable nor possible to force by legislation any one method of preventive treatment upon physicians in private practice, it is the right and duty of the state to provide for children born in almshouses the best treatment thus far known, and to require for them the use of the silver nitrate solution, or of some other prophylaxis which may in the future prove to be equally efficacious."

Report of the Committee on Resolutions Relating to Purulent Ophthalmia of Infancy.

After a full consideration of all the information at hand, including a detailed study of statistics, etc., the committee reported in favor of adopting the following resolution:

"*Resolved*, That we approve of legislation which would result in the invariable use of this method in almshouses, or of any other equally safe and efficient method, whereby the loss of vision from this disease would be lessened."

The resolution was adopted.

Some Unusual Tumors of the Eye and Orbit.—Dr. C. S. Bull, New York: Doctor Bull reported one case of sarcoma which was supposed to be due to an injury of the eye received at some previous time, and a second case in which the microscopic examination showed the appearance of tubercles, but in which the clinical history of tuberculosis was negative.

Discussion.—Dr. H. Knapp: Doctor Knapp stated that these cases were rare, but that he had seen two cases where the origin of sarcoma from trauma was not problematic, but followed the injury at once.

Doctor Pooley reported a case in which a supposed sarcoma of the orbit had been removed, and later examination showed it to be a tuberculous tumor of the lachrymal gland. The patient was a strong healthy individual without any history of tuberculosis.

Osteoma of the Orbit, with Enophthalmus.—Dr. E. Fridenberg, New York: The two features of interest in this tumor were, first, the position of the tumor, which was located much more towards the temporal aspect of the orbit than usual, the mass of the osteoma being about at the center of the upper orbital margin, and, secondly, the position of the eye, which was crowded backward into the orbit and slightly downwards; in other words, there was enophthalmus instead of the customary exophthalmus. The tumor with the anterior wall of the sinus was chiseled away, and the patient made a good recovery, though the eye remains still slightly lower than its fellow. Vision of 22/100 was improved to 20/50 by the use of glasses; the Javal ophthalmometer showing the presence of 8D astigmatism, which was corrected by $+4.$Dc. ax. $90^{\circ}\bigcirc-4.$Dc. ax. 180°.

Abscess Involving the Frontal Sinus, with Destruction of the Vault of the Orbit and Depression of the Eyeball.—Dr. C. F. Clark, Columbus: This abscess seemed to occur as the result of traumatism, the patient having received a blow in the face about a year previously, and having suffered more or less continuously with headaches and other symptoms

that might be attributed to abscess in the sinus. The bone had been eroded to such an extent that the brain cavity was invaded, and the depression of the eye was sufficient to produce a hyperphoria of the opposite side equal to 5½°. The patient did well after operation, but the wound has not thoroughly healed, probably because of the presence of some sequestra.

During the year before she came for treatment she would occasionally have attacks of pain, followed by discharge of mucus and pus from the nose and mouth, and she noticed that at such times the size of the swelling of the orbit diminished. Pressure over the swelling met with such firm resistance that it was at first suspected that the condition was produced by an osteo-sarcoma.

A Large Tumor of the Orbit (Fibro-sarcoma) of Twenty-three Years' Standing—Removal.—Dr. F. M. Wilson, Bridgeport, Conn.; Doctor Wilson exhibited this pathological specimen, which was of immense size, for an orbital tumor. The patient had the power of opening the lids, but could not close them over the tumor except by taking hold of the free border of the upper lid and pulling it out. The tumor had existed for a remarkably long time, and there were conflicting opinions as to the advisability of an operation. The operation seems so far to have been a success. Although the eye was so displaced that the cornea was 1¼ inches in front of the orbit, motility of the iris and some vision had been retained.

Doctor Pooley remarked that in New York a tumor seldom got the opportunity to grow to such a size. He had seen the case previously and advised operation.

A Case of Lipoma of the Orbit.—Dr. Emil Gruening, New York: Doctor Gruening referred to the very great rarity of lipomas of the orbit, and then reported his case, which occurred in a young man. It was a lobulated tumor about the size of a Lima bean, and microscopic examination showed nothing but fat cells. The author stated that most tumors of this class that had been heretofore reported were sub-conjunctival tumors.

Discussion.—Doctor Holden stated that the more we examine tumors of the orbit the more surprised are we at the great variety that occur there. He referred to one 1⅓ inches in length by ¾ of an inch in width, two-thirds of which was a purely lipoma, a small portion angioma and one end of it distinctly fibromatous, and said that the association of these three varieties was not uncommon.

Dr. H. Knapp reported a case parallel with Doctor Gruening's, in

which the tumor was partially encapsulated, and was so large as to necessitate its removal in three sections at three different operations.

The Treatment of Entropion of the Lower Lid with Caustic Potash.—Dr. Samuel Theobold, Baltimore: "In applying this method the aim should be to produce an escar 3 to 4 mm. wide, parallel with the lid margin and extending the whole length of the tarsus. The action of the caustic should not be allowed to approach nearer the edge of the lid than 1½ to 2 mm. When the requisite effect has been produced the caustic action is checked by the application of vinegar diluted with an equal quantity of water, or a solution of acetic acid of about the same strength. The escar soon begins to contract, and the lid, which up to this time has been held in an everted position, no longer shows an inclination to turn in. It is seldom necessary to repeat the operation, but it can be done if necessary."

Doctor Theobald thought the treatment especially applicable to senile entropion, but useful also in other varieties. Better results, it was thought, could be obtained by the use of the caustic than by the knife, and no other anæsthesia is necessary than the local application, on cotton, of cocain.

Discussion.—Dr. Knapp: "I am thankful to Dr. Theobald for this paper, for senile entropion has vexed me considerably, and I have employed a number of operations, but without equal or satisfactory success. I think this method proposed is more thorough, and better adapted to the purpose than the actual cautery."

Dr. Abbott asked why soaking the lids with cocaine was considered preferable to its hypodermic use?

Dr. Theobald replied that he did not specially prefer it, but had not found the hypodermic necessary. He referred also to some cases in which other operations had been performed without success, and in which the caustic potash accomplished the desired result.

Dr. Gruening stated that he had found an operation similar to Hotz's method entirely satisfactory.

Dr. Noyes stated that he used a similar operation, but removed a narrow strip of skin, and inserted deep sutures into the orbital tissue.

Lymphoma of the Lids.—Dr. Myles Standish, Boston: Dr. Standish reported a lymphomatous growth in the lower lid close to, but not involving, the lachrymal sac. The administration of arsenic had resulted in its cure.

Dr. de Schweinitz referred to a number of lymphomas and sarcomas that had been favorably treated with preparations of arsenic, and stated

that while we must not depend entirely upon the administration of arsenic in morbid growths, there are a sufficient number of cases improved by its use to show that we must be careful about operating simply upon the clinical diagnosis of these tumors.

A Case of Spindle-cell Sarcoma, Involving the Conjunctiva and Cornea; Removal of Growth without Impairment of Sight.—Dr. S. B. St. John, Hartford: The patient was a man 72 years of age, who had lost the right eye twelve years previously as the result of traumatism. The growth appeared upon the left eye, and grew in 2½ months from the size of a pin's head to that of a large pea. It sprang from the conjunctiva, was movable with that tissue, and overlapped the cornea. It was removed much after the fashion of a pterygium operation.

Conjunctival Melano-Sarcoma, Involving the Cornea.—Drs. John Green and A. E. Ewing, St. Louis: The tumor was a true melano-sarcoma, involving the tissues above named to such an extent, and was of such a size that it became necessary to enucleate the eye.

Hypopion Keratitis, Break in Descemet's Membrane; Preceding Perforation Fluorescine Passed Through the Ulcer into the Anterior Chamber.—Dr. John Green and Dr. A. E. Ewing, St. Louis: A case of traumatic ulcer of the cornea was reported, in which hypopion of 5 mm. in height occurred. The treatment which Dr. Ewing followed with good result was the free use of hydrogen peroxide, solution of normal strength, applied on a little mop to the surface of the ulcer, held there, and the application renewed a half a dozen times until cessation of the ebulition which takes place. On using this application bubbles of gas would appear in the anterior chamber, but this was rapidly absorbed, and in a few hours nothing remained of it. Fluorescine produced its characteristic reaction. The hydrogen peroxide seemed to have the effect of breaking up the hypopion mass, and producing the good results that occurred.

The conclusions are that one source of hypopion keratitis is through a direct break in Descemet's membrane, or by exudation from the iris, or thirdly, possibly from the epithelium of Descemet's membrane.

Discussion.—Doctor Holden opposed the idea that the hypopion could come from the cornea, and cited Elchnig's recent experiments to prove that just the reverse happened, and that the pus cells found in the cornea had gotten there secondarily. He believes that the break in Descemet's membrane always begins with the changes on its posterior surface.

A Case of Interstitial Keratitis Congenital in Origin.—Dr. H. F. Hansell, Philadelphia: The patient was first seen when only thirty-six hours old, and presented these symptoms: a thin watery discharge from the eyes, lids slightly swollen and bluish red in color, conjunctiva smooth, but the ocular portion distended from the fornix to the limbus of the cornea by an almost transparent effusion. The cornea showed on inspection a gray infiltration of the deep layers, consisting of fine points that tended to become confluent, most dense over the pupil, without vascularity or loss of epithelium. The child was poorly nourished, probably because of the fact that the mother, though ordinarily a healthy woman, had been in bad health throughout the pregnancy. There was no history of specific disease. The child was given tonic treatment, and at the end of six weeks there remained only a slight opacity of the right eye. The local treatment consisted of the application of mydriatics. A similar case is referred to, which was reported by Barnacheff, in which the cornea became entirely clear.

New Treatment of Ulcers and Other Infectious Diseases of the Eye by Cassareep.—Dr. S. D. Risley, Philadelphia: This preparation is made from the juice of the black cassava, was first introduced here by Dr. Chandler, and is used in a 10 per cent. ointment. It is applied freely between the lids, and the eye subjected to massage to distribute it, and in the corneal cases the protecting bandage applied. It causes no irritation and rapidly produces improvement.

Discussion.—Dr. John Green stated that he had seen the natives making cassava bread, and that among them the juice had the reputation of being preservative of flesh.

Dr. Myles Standish has been using the preparation since Dr. Chandler originally introduced it, and thought that in the case of corneal ulcers, if the ointment be used for some time after healing has occurred, the scar is less dense than if treated by other means.

Doctor Jack had used the preparation, but said that in some cases it had been rather irritating.

Doctor Risley stated that he had not noticed any difference in the degree of opacity as compared with other methods of treatment, but believed that that would depend rather upon the amount of tissue destroyed.

Spontaneous Expulsion of a Foreign Body from the Anterior Chamber.—Dr. J. P. Worrell, Terre Haute: The patient was a boy who had received an injury of the right eye while exploding a gun-cap by striking it with a hammer. After the inflammation had cleared up a small piece of bright

metal could be seen on the inner surface of the cornea. The patient declined operation for its removal, and some days later appeared with the statement that "feeling something scratching the eye he rubbed it with a bit of cotton and removed, with some secretion, a small piece of bright copper." No inflammatory trouble followed.

Discussion.—Doctor Hansell reported a case where a piece of steel had been in the anterior chamber, according to the patient's story, fifteen years, and was spontaneously extruded.

Some of the Earlier Symptoms of Senile Cataract.—Dr. W. F. Mittendorf, New York: Doctor Mittendorf has carefully observed the last 508 cases of incipient senile cataract that have appeared in his practice in order to determine the exact location of the first changes in the transparency of the lens. Of these 106 were central and 402 peripheral, and of the latter the starting point of the striæ was found in the upper periphery in 13 cases only, in the outer periphery in 47, in the general periphery 48, and, the greatest number, 286 cases, in the lower and inner quadrant. Admitting that cataractous changes do not depend upon senility alone, but more particularly upon the nutrition of the lens, Dr. Mittendorf offers as a possible reason for the great prevalence of opacities in the lower inner quadrant the theory that there is a constant accommodation for small objects, especially reading by artificial light, requiring a more or less forced convergence and a downward look, during which the pressure upon the surrounding tissues is an impediment to the nutrition of this particular portion of the lens.

Discussion.—Dr. Risley thought that these opacities in the lower and inner periphery of the lens is often associated with chorioidal disturbances in that section. He had noticed it particularly among ironworkers, where it seemed to be due to the heat to which they are subjected, this being the least protected portion of the eye.

The Operations for Secondary Cataract.—Dr. H. Knapp, New York: Doctor Knapp reports a very interesting case of secondary cataract operation. The primary operation for removal of the cataract was without special interest. The capsule, becoming cloudy, and necessitating a secondary operation, it was needled in the ordinary way. The immediate result was good; but two days later reaction occurred, and a severe, acute glaucoma set in. An iridectomy was at once attempted; but it was found impossible to catch hold of the iris, so the operation was abandoned. The patient was relieved, however, of all pain and discomfort as a result of the paracentesis, and remained so for four days,

when trouble again set in. A second attempt at iridectomy was made, and this time successfully. The relief was permanent.

Dr. Knapp then gave a tabulated report of 70 cases of secondary cataract operated upon since October, 1897. Sight was improved in 63; remained the same in 6, and was almost lost in 1. Two cases besides the one quoted above were complicated by glaucoma, one of them being relieved by myotics, and the other by an iridectomy.

Considering the advisability of operating in cases that have vision not below 20/70, the author says that it must depend upon the case, but that ordinarily he believes we should attempt to give the patient the best sight his eye is capable of, especially as the secondary operation is, rare accidents excepted, safe.

He considers discission the proper operation, and lays down as a rule of paramount importance, "cut, don't tear." As the region of the wound made in the primary extraction is the weak point in these eyes, he considers it advisable to avoid that region as much as possible in the secondary operation, and a T-shaped incision in the capsule is thought to be best, the horizontal arm of the T being situated below the linear scar, which Dr. Knapp makes in the capsule when extracting.

Discussion.—Dr. Roosa advocated the plan of removing the capsule in the secondary operation, instead of doing a discission.

Dr. Noyes preferred the discission, and stated that he had occasionally introduced a long needle through the sclera because it gave a better leverage when cutting the capsule. Occasionally he had used a second needle passed through the cornea at the same time.

Dr. C. J. Kipp referred to the difficulties encountered in attempting to remove the capsule.

Dr. Callan stated that he found himself more and more inclined to the use of the De Wecker scissors.

Dr. Pooley thought that all the operations, other than discission with a sharp needle knife, were open to serious objections.

Dr. Knapp thought that discission is by far the safest operation, and is indicated in at least 95 per cent. of cases.

Delayed Union after Cataract Extraction.—Dr. Geo. C. Harlan, Philadelphia: Dr. Harlan reports two more cases of delayed union after cataract operations, in one of which union took place somewhere between the 10th and 17th days, and in the other at the end of 20 days. By a review of the literature he found 26 similar cases, in which the delay had lasted from 5 to 20 days. In 20 of these cases no cause

could be given for the wounds having remained open. He states that such cases seem to require no special treatment other than atropia and slight pressure bandage, together with treatment of any complications that may arise.

Discussion.—Dr. Noyes had had such a case in a gentleman over 70, where the wound failed to unite for over a fortnight, the edges of the wound being actually inclined to eversion. The wound finally healed, and the man enjoyed good vision for ten years.

Dr. Gruening believed that one cause of the delay might be that the operation had been done within the clear cornea, and thinks that he gets most rapid healing when he makes the conjunctival flap.

Protargol in the Antiseptic Preparation of the Conjunctiva, Prior to Cutting Operations on the Eyeball.—Dr. B. E. Fryer, Kansas City: Doctor Fryer uses a 2 per cent. solution of protargol as an antiseptic, and finds it preferable to solutions of bichloride, etc. It is destructive of all organisms, and is not irritating.

Buphthalmia, an Interesting Series of Cases Occurring in the Same Family.—Dr. Walter B. Johnson, Paterson, N. J.: Three children in one family were found buphthalmic within the first few years of life. Ophthalmic examinations were not satisfactory. Two of the children were operated upon in Naples, and the third here by Doctor Johnson. In every case the progress of the disease was arrested. The mother's eyes were normal, but the father thought he had never seen out of one eye, in which a disintegrated calcareous lens prevented a fundus examination.

Discussion.—Doctor Harlan recalled the statement of Mauthner made some years ago that buphthalmia is simply congenital glaucoma.

A Contribution to the Pathology of the Eye and its Appendages.—Dr. G. E. de Schweinitz, Philadelphia: Case 1. Primary carcinoma of the Caruncle. A small growth entirely replacing the right caruncle, about the size of an ordinary pea, and which had existed for a number of years. Microscopic examination proved it to be carcinomatous. So far as known there has been no recurrence.

Case 2. Prelachrymal growth with the histological characters of tubercle. A small tumor anterior to the lachrymal sac was discovered while probing the tear duct. It was easily removed, and on examination showed the appearances of tubercle, although no tubercle bacilli could be found.

Case 3. Angioma of the lachrymal gland extending to the apex of the orbit; removal with preservation of the globe, functions of the eyeball, and of the external ocular muscles, with the exception of the

levator, which was involved in the growth. This tumor, which is exceedingly rare, consisted of an angiomatous growth involving the lachrymal gland, and extended deep into the orbit. It was probably congenital. In front of the ear, on the same side, there was a small cavernous angioma about 1½ inches in length and 1 inch in width, but not communicating with the growth of the lid.

Discussion.—Doctor Fryer asked if, in the examination of the carcinoma, coxidia had been found.

Dr. de Schweinitz said that he believed that there was considerable mythology connected with the pathology of coxidia.

Doctor Bull reported a similar case of prelachrymal growth, which had been removed on the supposition that it was a cyst.

Remarks on Cases of High Myopia; Treatment of one Case by Removal of the Crystaline Lens.—Dr. H. D. Noyes, New York: "The interesting features of this case are, the early occurrence of converging squint—that a rapid development of myopia occurred between six and eight years of age—that the removal of the lens produced a change of 16D., and with it an improvement of vision to double the previous condition; that binocular vision was not secured by the refractive changes, and that diplopia was never observed."

Contribution to the Operative Treatment of High Myopia, with Report of an Additional Case.—Dr. W. H. Wilmer, Washington: In the case reported by Dr. Wilmer the operation decreased the myopia by 22.5D., and the vision was double what it had been before operating. In regard to the mode of operation the author preferred a slight discission, making a very small opening in the anterior capsule, followed by extraction within six days. As to the amount of myopia which offers the best operative result, he considers the ideal case to be the one wherein two or three diopters of myopia would remain after the operation. According to his experience this would mean a myopia of twenty-five diopters.

Discussion.—Doctor Noyes believed that if the operation were limited to cases of this degree the amount of chorioidal trouble would be so great as to incur great risks in the operation. He believes that we are justified in operating in young subjects with 13D. or more of myopia if the fundus is in good condition.

The Pathology of Experimental Quinine Amblyopia.—Dr. Ward A. Holden, New York: Doctor Holden's experiments were made with the aid of the newer stains for nerve tissues, and he exhibited drawings showing the changes that exist at various stages of the quinine poisoning.

The first changes were shown in the breaking down of the ganglionic cell bodies and a deposition of myoline-like substance in the nerve fibers. This appeared within three days after administration of toxic doses. From that time until the seventeenth day more ganglion cells were destroyed, and at that time changes in the optic nerve, consisting of a breaking down of the medullary sheaths of the fibers, was noticed.

By the forty-second day the ganglion cells and the nerve fiber layer had almost entirely disappeared, and the degeneration could be traced up to the external geniculate body and pulvinar. No signs of degeneration could be found elsewhere in the brain or cord.

Two Cases of Premature Delivery to Preserve Sight.—Dr. A. E. Adams, Newberg: Doctor Adams reports two cases of albuminuric neuroretinitis occurring in pregnant women, with vision reduced to a very low point. Shortly after premature delivery the vision showed marked improvement, and the author concludes that if abortion is ever justifiable it is in these cases, especially as the uremic condition of the blood is dangerous to the life of the fœtus as well as a menace to the mother.

Implantation of Sponge in the Orbit after Enucleation.—Dr. S. B. Risley, Philadelphia: "A fragment of surgeon's sponge, carefully sterilized, was pared down to a size just sufficient to fill loosely the cavity left by the removal of the ball, and to permit the suturing of the conjunctiva and the subconjunctival tissue over it without undue tension.

"The design was to furnish a framework for the deposition of connective tissue in the orbit, and thus avoid the concaved socket which follows enucleation, and always permits the accumulation of tears and mucus behind the artificial eye. After the operation the appearance was much the same as that presented after the insertion of a glass globe as in the Mule's operation. Two or three months is required to complete the process of absorption of the sponge and the deposition of new tissue."

Exhibition of Chalazion Forceps.—Dr. C. J. Kipp, Newark: These consisted of a simple forceps, one blade of which was solid, and the other contained a slit, so that when this blade is placed over the conjunctival surface of the chalazion the latter may be incised through the slit and its contents squeezed out by pressure.

A REPORT OF THE PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY OF THE AMERICAN MEDICAL ASSOCIATION.

FIFTY-FIRST ANNUAL MEETING, HELD AT DENVER, COLORADO, JUNE 7TH TO 11TH, 1898.

BY H. V. WÜRDEMANN, M.D.

MILWAUKEE, WIS.

(*Continued from August Number.*)

(*Continuation of Discussion on Changes in Refraction.*)

F. C. Hotz, of Chicago, Ill. The fact that eyes may change in a considerable number of cases should put us on our guard regarding remarks as to the fitting of glasses which patients may previously have worn. He notes that a large number of his own cases are subsequently fitted with different lenses. The trouble is that a great many patients go to some one else for the second examination, if at any time the glasses they are using become unsatisfactory. One of his cases had increased from —.75 cyl. in 1887 to —1.50 cyl. in 1897. In another case there was a change from emmetropia to a high degree of myopic astigmatism. In another case in 1893, —1. s. combined with +4. cyl. and in 1897 —2. s. combined with —5. cyl. He had found three cases in which hypermetropic astigmatism had increased, which is remarkable because statistics show that if the eye changes during school life the tendency is to develop myopic conditions.

G. C. Savage, of Nashville, Tenn., said that Bane should not have left out ophthalmometric measurements, as it was not yet settled where changes in refraction occurred. One of his patients, who had never been able to get away from him, was himself. He had found that his own myopic astigmatism had increased within nine years from —.50 cyl. to —2.25 cyl. in each eye. He thinks the radiating fibers of the ciliary muscle help to correct the astigmatism. These are not under the control of the third nerve, and it is impossible to reach them by mydriatics and to reveal them except by gradually changing the glasses as the astigmatism may increase.

H. V. Würdemann, of Milwaukee, Wis. One factor in the production or correction of astigmatism has not been dwelt upon, that is, the effect

of lid pressure. Intense blepharospasm or chalazion produces a considerable amount of astigmatism, which, after cause has been relieved, passes away. There are some patients with astigmatism against the rule, who are in the habit of correcting it themselves, in whole or in part, by lid pressure. We may at the time of examination correct the total astigmatism, but when the patients are examined later on we find a recurrence, the elasticity of the cornea having asserted itself and instead of, for instance, as in a case recently observed, where there was on the first examination 2 diopters of corneal astigmatism; on a subsequent examination the amount was 3.50.

T. A. Grigg, of Butte, Mont., was of the opinion that if astigmatism was brought out by a subsequent examination it was latent and had not been fully corrected; it was there before and the mydriatic had not been used long enough or in sufficient quantity to overcome the defect. In young people the elasticity of the lens is great and eyes that have a considerable amount, which before using mydriatic could read 6/VI distinctly, afterwards could read less than half that amount. He was of the opinion that cocain might produce astigmatism as it acts upon the corneal epithelium, producing an irregular astigmatism. He agrees with Fox of Philadelphia that astigmatism is an invisible and subtle child of the devil whose hiding place is the ciliary muscle of the eye and is said to hate atropin as his father hates holy water.

J. E. Minney, of Topeka, Kas., believed that changes in the ocular refraction could take place, and had noted this difficulty ever since he began to practice ophthalmology.

J. L. Thompson, of Indianapolis, Ind., said that one cannot make methodical calculations for the human eye, and that he would not be surprised at anything that could there take place. He had cases examined years ago in which he had given plus cylinders, and when again examined found that these had changed from positive to negative astigmatism.

Edward Jackson, of Denver, Colo., had ten years ago reported a series of cases of increase of hypermetropic astigmatism to the American Ophthalmological Society, being interested at first by his own case, in which there was no question as to the refraction at different times; his eyes were measured repeatedly while experimenting with different mydriatics, there being no difference shown in the astigmatism, .50 D. in one eye and .75 D. in the other. After two or three years of hard eye work with the microscope, etc., he found that his glasses no longer fitted him, and examination showed that the astigmatism had increased 1.25 in each

eye, two or three years later it showed 1.75 in one eye and 2.00 in the other, during the last eight years the amount of astigmatism has remained constant.

These changes in astigmatism may not depend upon any changes in the cornea, although the opthalmometer will show corneal changes in young people. Astigmatism against the rule is more apt to arise in middle life than it is earlier, and there are more cases after the age of 50 than before, which shows that these are dependent upon some change in the lens or its position.

H. B. Young, of Burlington, Iowa, showed that what is popularly known as second sight, *i. e.*, the refusal of glasses by people of 50 or 60 years of age who have previously used glasses, is due to the beginning of opacity in the periphery of the lens. All of these show a development of astigmatism against the rule. It is questionable whether the astigmatism following cataract extraction is purely due to the aphakia.

C. E. Norton, of Lewiston, Me., described a case in which a compound error of refraction had been decidedly changed by pressure of chalazion, operation on the tumor restored the *status quo*.

In the opthalmometer we have an instrument of great accuracy for estimating the corneal astigmatism. He considers it a practical instrument for office work.

Henry Gradle, of Chicago, Ill., quoted the case of a girl who had been examined in 1892, whose eyes showed a myopic astigmatism of 1.50 axis 180°. In 1897 he found the astigmatism increased to 4.50 with the rule, and with the best correction scarcely more than 20/XXX vision. He had seen two cases where astigmatism had been produced by the pressure of chalazion, and where the subjective findings changed completely within two weeks after the removal of the tumor.

Wm. C. Bane, of Denver, Col., did not think that latent astigmatism theory was tenable. In the cases reported by the gentlemen, mydriatics had been used to an extent which would have brought it out if it were present.

The majority report of the Committee on the Condition of Eyes and Ears of Railway Employees was presented by Frank Allport of Chicago, Ill., and a minority report presented by C. F. Clark of Columbus, Ohio.

The reports were received and laid over until next year, the committee being continued.

After some discussion it was resolved, upon motion of Dr. C. H. Wil-

liams, to refer the matter back to the committee and to enlarge the committee by the addition of two new members.

It was further resolved that the report received from the above committee should be printed and distributed to members of the section in order that they might be able to present any other recommendations to the new Committee, and that their report shall come up for action at the next annual meeting.

The chair appointed as the two new members of the committee Drs. C. H. Williams and Dudley S. Reynolds.

Leartus Connor, of Detroit, Mich., "*Some Causes of Failure in Treating Diseases of the Lachrymal Apparatus.*" Grouped these under four heads, viz.: Constitutional disorders, eye strain, nasal disease, and faulty technique.

As the knife never cured a case of syphilis or rheumatism or rheumatic gout, it is impotent in cases of lachrymal obstruction due to these and allied diseases. That operator who forgets this fact is sure to see his most skillful technique come to naught, yet such failures are not infrequent.

That eye strain may cause lachrymal obstruction, is a matter of not infrequent observation, and the failures due to a neglect of this possible factor, have cast unmerited reproach upon the work of otherwise accomplished operators. The facts warrant its elimination from every case of epiphora.

As the lachrymal duct empties into the nose, it is a fact that intranasal disorders may obstruct the exit of the tears, at the mouth of the duct or by extension upwards along its walls.

As many ophthalmic surgeons, pay no attention to nasal diseases, they sometimes overlook accompanying nasal disease and so contribute to the failures in treating lachrymal obstruction. The condition of the nose should be examined in every case of epiphora, and all morbid conditions affecting the functions of the duct removed.

In the faulty technique attention was directed to six points:

1. The division of the canaliculus in such a manner that the opening was directed away from the eyeball and lachrymal lake, so that the tears could not reach the passage.

2. Failure sometimes followed the unnecessarily extensive division of the canaliculus, when a simple operation, as recommended by Prout, on the perpendicular portion of the canaliculus was ample.

3. For reasons mentioned, failures are less frequent when the upper canaliculus is selected and the lower left intact. The latter is larger and

better located for drainage, while the upper more readily admits probes and knives for operating on the duct strictures.

4. Undue violence, by destroying healthy tissues, making false passages, twisting and tearing the lining membranes, is responsible for many failures.

5. Timidity in using force adequate to properly dilate strictures is quite as bad as undue force. If accurate diagnosis be made and the size and direction of probe be correct much force can safely be employed; indeed only such force will prevent some failures.

6. Rigid ideas respecting the shapes and sizes of probes diminish the chances for success. The probe must be selected for the special canal and stricture, rather than the latter made to accommodate itself to the former.

G. Melville Black, of Denver, Colo., "The Use of Large Probes in Strictures of the Lachrymal Duct." Under the above title no reference is made to mild cases of lachrymal disease wherein simple methods will effect a cure. Special attention is called to the necessity of not destroying the lower canaliculus. The canaliculus of the upper lid should be the one selected for slitting preparatory to passing probe. This canaliculus has less suction power, and is therefore best sacrificed. After the duct has been rendered patent, the lower canaliculus, still being intact, is able to effectually drain the palpebral aperture, whereas, were it destroyed, the upper canaliculus would not be able to prevent epiphora. The operation of slitting the canaliculus is performed with a Graefe cataract knife, with the aid of a Bowmans grooved director. A graduated probe is passed to explore the canal. If strictures are encountered, they are cut with an Agnew knife. It is found that it is rare that a No. 10 Theobold probe cannot be passed at the first sitting. Larger probes are passed from day to day until the largest size which the canal will admit is taken. It is usually possible to pass a No. 14 Theobold probe within the first few days. It is important that strong pressure be made on the swollen mucous membrane of the canal.

The use of the negative pole of a galvanic battery attached to the probe is found to assist in promoting absorption. Pledgets of lint cooled on a block of ice and soaked in lead and opium wash are recommended immediately after the primary operation. The eye and region of the lachrymal apparatus should be kept covered with these pledgets for the first forty-eight hours. After the passage of the probes, the canal should be syringed with a sat. sol. boric acid, and then 10 per cent sol. ichthyol. The probing should be carried out daily for ten days; then three times a week for two weeks; then according to indications until epiphora ceases.

A cure is usually accomplished in two months unless dead bone is present. Electrolysis should be practiced about once a week until its use is no longer indicated.

H. O. Reik, of Baltimore, Md., "*The Value of Large Probes in Strictures of Lachrymal Nasal Duct*," reported 130 cases of lachrymal stricture in which the large probe had been used up to and including No. 16 until the cases were pronounced cured. Thirty-eight of these cases had been under observation for periods varying from two to eight years, and only two had relapsed. The percentage of cures in cases which submit to a thorough treatment by the probe method is found, in the experience of Theobald and Reik, to be 95 per cent, and about 5 per cent of these may relapse.

C. R. Holmes, of Cincinnati, O., "*Extirpation of the Lachrymal Sac and Gland*," believes in conservative surgery, so long as milder means will accomplish the desired object. After reviewing extensively the literature on this subject, gives the following indications for the removal of the tear sac and gland:

1. In cases where it becomes necessary to operate upon the globe, as for cataract or glaucoma, especially so should there not be sufficient time to carry out other methods of treatment.

2. In patients who cannot devote the time, or who may be unable to endure the treatment by probing.

3. In all cases where conservative treatment has failed to cure within a reasonable time.

Epiphora is, in a large number of cases, due to an inflammation of the sac, resulting from an extension of the inflammatory process from the nose through the bony canal, and the retention of tears in a sac, so infected by the inflammatory process from the nose, forms an ideal place for decomposition and resulting inflammation, which may rapidly pass through the various grades of inflammatory changes, from slight catarrh to ulceration of the mucous membrane.

Operation and Technique: The administration of a general anesthetic is necessary and thorough asepsis imperative. The patient's hair, after being shampooed, is enveloped in a moist towel, a strip of gauze is packed firmly up under the inferior turbinal, over the exit of the canal, to prevent the blood from passing into the patient's larynx.

Extirpation of the Sac and Canal: The sac, if possible, should be hulled out as we would a cyst, without rupturing. In order to clearly outline the sac it is injected with a thick starch, warm and colored with iodin. The incision is made along a line which corresponds with the

center of the membraneous portion of the sac and parallel with the muscular fibres of the orbicularis palpebrarum.

The upper portion of the sac rises to the upper edge of, or slightly above, the tendo-oculi. The skin and underlying tissue is carefully dissected through until the sac is exposed, the lips of the wound are held apart by three or four pronged retractors, and the sac shelled out of the lachrymal groove without tearing its coat or opening the vessels in the immediate neighborhood of the sac. The sac is dissected out from under the tendon ; in some cases it is necessary to cut the tendon or depend upon the curet.

The bony canal is next curetted, the wound cleansed by syringing, and closed by deep and superficial stitches ; if the tendo-oculi is severed, it must be replaced by heavy stitches. The canaliculi are split throughout their entire length, and the cut surfaces then cauterized with a flat platinum cautery point, to destroy all lining membrane and cause complete obliteration by granulation. Borated vaselin is placed on the wound, and a firm compress, to favor ready adhesion of its walls, is held in place by isinglass strips.

Extirpation of Lachrymal Gland: The incision is made along the margin of the orbit, cutting against the bone, beginning at center of upper orbital arch; it is carried to point 3 mm. below the outer canthus, the fascia or orbital septum is cut through along its attachment to the orbital margin, the good tissue is quite friable, and care must be taken in dissecting it out.

In some cases it will be advisable to remove a portion or all of the palpebral gland. The wound is not closed before all hemorrhage has ceased; it is then closed by two deep and three or four superficial fine silk sutures covered with sterilized borated vaselin, gauze and cotton, and pad fixed with strips of isinglass adhesive plaster.

Dudley S. Reynolds, of Louisville, Ky., had never seen lachrymal disease in a perfectly sound and healthy individual. He had serious objections to entering inflamed mucous-lined channels with probes, and utterly abhors the idea of the Theobald probe, 4mm. in diameter. A probe of that size can scarcely be passed through the bony passage of the Caucasian subject without doing damage, although it is possible to do so in the case of a negro. There is no cause of epiphora that cannot be discovered by careful examination, and if it be due to some destruction of infiltrated tissue arising from trouble in the nose, it should readily be found if sought for. He has heard a great deal about the innumerable cures of systematic probing, but he has never seen any. Carefully advised constitutional

agents and the confining of local treatment to the diseased membrane of the nasal cavity results well. If by the use of Anel's syringe a 2 per cent. solution of sodium chlorid may be passed through the canal when no suppurative changes are present, this is a counter-indication for any surgical measures.

The cases described by Holmes belong to a special class. They are not only chronic cases, but people with constitutional taints, or who have been treated by harsh means and the canal destroyed. Primarily epiphora calls for no probing and the presence of the condition merely suggests abnormal conditions that exist in the nasal apparatus.

Casey A. Wood, of Chicago, Ill. Probing is sometimes proper and a cure may be looked for by this means. It is not always possible to discover whether probing has succeeded because patients become tired after a while of having their nasal ducts probed and cease to appear at the office of the surgeon. The patient often gets much relief at the outset; the epiphora is relieved, the symptoms disappear, the patient thinks he is cured and does not come back. In Chicago men and women seem to have very little time on their hands, and will not continue a treatment for weeks which is not only painful but tedious. He does not treat these cases for more than two or three weeks, an amount of time which a patient will usually give; uses as large probes as possible, teaches the patient to use the probe himself and allows him to use the treatment indefinitely at home.

Frank Allport, of Chicago, Ill. The reason why we do not get better results in these cases is because many are treated along stereotyped lines. It is objectionable to rip up the apparatus and pass in probes that are as large as can be possibly put in.

Eighty or ninety per cent of the cases of epiphora originate in the nose and should be treated primarily from that standpoint, which is practically ignored by most surgeons. He has learned to abhor and detest the large probes and has better results if the canal may be large enough to pass a No. 6; but if the physiological suction apparatus is destroyed, the tears will stand in the sac and not go down. He does not cut the punctum if he he can help it, but stretches it and divides the stricture in the duct by means of a hollow probe which contains a concealed knife. (Instrument exhibited.)

J. E. Minney, of Topeka, Kan. Every oculist must be more or less of a rhinologist. Personally he does not use any larger than Bowman No. 8 probe and has treated 250 cases.

George M. Gould, of Philadelphia, Pa. In a large number of cases the

epiphora is somewhat due to excess of tears and not because the duct will not carry off the normal secretion. Eye strain is at the bottom of some of these cases. Long continued eye strain produces chronic conjunctival trouble with excess of tears. Where there is not an organic stricture astringent lotions may be massaged into the duct and the excess thereby cured.

J. L. Thompson, of Indianapolis, Ind., thought that some cases of epiphora were due to irritation from smoking, etc., which could be cured by stopping of the habit. He had noted himself that he did not ever have the result that the authors of new methods had in any form of treatment; he never promises the patients a cure of anything, and especially should this be done in lachrymal obstruction.

T. A. Grigg, of Butte, Mont. Laying aside those cases due to eye strain, slight catarrhal troubles and the like, and taking up those cases of pure organic obstruction, the first thing is to dilate the punctum and try to pass boracic acid solution through the duct by means of Anel's syringe. The nose is examined thoroughly, and if stricture is present in the duct is divided and from 6 to 8 Bowman probe is passed. In those cases which cannot remain for a time under treatment, he uses a canula about as large as a 6 or 8 Bowman probe and leaves it in place from three to nine months with very satisfactory results. There is a pathologic law that an intermittent pressure will produce hypertrophy and continued pressure will produce atrophy; a lachrymal canula produces pressure on all sides and causes an atrophic condition that relieves the obstruction. Where there is a purulent condition the canula may be omitted for a few days and the duct syringed with nitrat of silver. Some cases treated five years ago are cured to the present time.

J. O. McReynolds, of Dallas, Tex. The ultimate object to be accomplished in treatment of lachrymal obstruction is by no means to secure a sufficient large nasal duct, diligent attention to the condition of the conjunctiva and correct glasses should be given; antiseptic solution should be used locally.

R. F. Le Mond, of Denver, Colo., in many cases uses a hollow (?) probe of lead allowing the patient to wear it a month, washing out the canal two or three times a week.

E. C. Ellett, of Memphis, Tenn. Lead styles possess advantages over perforated canulæ, are more convenient, more easily fitted to the case and secure much better drainage than through the lumen of the canulæ.

L. Webster Fox, of Philadelphia, Pa. The treatment of lachrymal obstruction is the bane of ophthalmic surgery. He believes in large

probes. He has found the use of the large Theobald probe and the lead styles, followed three or four days later by the use of the hollow canulæ devised by Bickerton of Liverpool and himself to be as satisfactory as any form of treatment. The canula is left in for six months, is taken out occasionally and the duct washed with a solution of boracic acid. Probing may have to be continued for years.

W. H. Wilder, of Chicago, Ill. It is an encouraging sign of the times to see so many men advocating conservative treatment of these cases. He predicted that in a few years indiscriminate probing of lachrymal cases will be relegated to the past. Many cases may be relieved completely if the conservative treatment be adopted in the beginning. Holmes' specimens illustrate very well the fact that in some the Theobald probe may be introduced, but in many of them such probes do great damage.

E. A. Kegley, of Cedar Rapids, Ia., teaches his patients to pass the probe themselves. He never goes above a No. 8 probe and thinks it is large enough to drain off the secretions. He has had 50 cases that he has been watching for eight years and every one of his patients is satisfied.

Leartus Connor, of Detroit, Mich. The earlier the case is seen the better the results. Probes should be used on the same general law that we use instruments anywhere. He has found that the large Theobald probe has particular success in cases where everything else failed. His conviction was that one of the forces by which the tears are discharged through the canal is the air going in and out over the end of the tube. He does not use the large probe if he can help and only when he is compelled to make a large opening in the sac.

It is necessary to make the patients understand that one passing of the probe will not cure them; if they will not take a long treatment, it is better not to have anything to do with the case.

G. Melville Black, of Denver, Colo.. plead for conservatism in the treatment of simple stenosis, but in difficult cases and in purulency of the sac it was necessary to do radical treatment. Probes should be large enough to open the passage and produce pressure and other operative forces. In marked cases mild measures accomplish very little.

H. O. Reik, of Baltimore, Md., said that the 130 cases considered in his paper contained none of mild epiphora due to obstruction of the puncta, or reflex irritation or slight catarrhal troubles, but all belonged to that class in which there is organic obstruction in the duct; the cases were followed up for periods varying from one to eight years, and he knows of no other treatment for this class of cases except the use of large

probes which will show 95 per cent. of cures. A 4 mm. probe can be introduced into the duct of the Caucasian subject. The plan of teaching the patient to use the probe himself has been made use of in many cases where the patient lives at a distance and cannot make frequent visits.

After the use of No. 8 to 10 probes the epiphora ceases in many of the cases and the patient is inclined to think it a cure, but unless the treatment be followed up, numerous relapses will be noticed.

H. Bert Ellis, of Los Angeles, Cal. "*Report of a Few Cases of Acute Glaucoma.*" I. G. M., aged 57, minister by occupation, January 8, 1895, while eating supper, a piece of dry toast choked him, and while coughing he felt something snap in his right eye. Soon afterwards his eye became painful, lids began to swell; solution of atropin and cocain was used by his physician; swelling and redness increased, pupil enlarged and tension slightly reduced; 1/2 per cent. solution eserin failed to contract pupil. Lens was dislocated downwards and backwards; under pressure bandage and rest the lens regained its normal position, but pupil remained large and irregular, lower part of lens cloudy, eye almost blind; two weeks later vision slightly improved, no pain, lids almost normal, injection diminished; vision left eye=3/XL+5.50s.⌒+.50c. 180° 6/VI and by addition of +3.00s. he could read number .50D.

February 1. Right lens cloudy; tension increased and cup glaucomatous; vision entirely gone; patient kept on eserin and refraction error corrected; nine months later lens clear, slight haziness of cornea, tension normal, disk cupped; six months after this he was suffering with some cold in the head, considerable pain in eye, and five days before reporting he had become almost blind; tension +3, pupil enlarged, media torbid. Iridectomy was done which gave him slight vision; —1.00s⌒ +5.00c., 125°=6/C.

2. Miss J. S. aged 24, Sept. 28, 1897: Acute pain in right eye on day previous, followed by sudden blindness; conjunctiva inflamed; photophobia, tension increased, pupil dilated; iridectomy done and on Nov. 4th, +2.75s.⌒+4.50c., 130°=6/XXIV. Dec. 8, 1897, —.75s.⌒+ 3.25c., 30°=6/XV.

Herbert Harlan, of Baltimore, Md., "*A Case of Hereditary Glaucoma.*" Reported a case of glaucoma, the patient being one of the fifth generation in which the disease had appeared. The case of a first cousin of this patient had been reported before the section in 1885. Both cases were successfully operated upon by iridectomy.

J. L. Thompson, of Indianapolis, Ind. Glaucoma may be a primary or secondary affection, and requires to be treated accordingly. When there

are no complications, iridectomy is preferable to all other modes of treatment, but where there is great chemosis of the conjunctiva with iridochorioiditis or cyclitis, leeches and fomentations must precede the operation. He had one case of acute glaucoma which accompanied retinitis albuminurica. He has only seen hereditary glaucoma once, which occurred in a girl 11 years of age whose father had syphilis, the child having conjunctival disease. She had chronic glaucoma 6 months before he saw her, the optic disks being much cupped and veins pulsating; eserin was first used for several weeks, iridectomy was made later, which was followed by hemorrhages into the anterior chambers of both eyes, final recovery with vision 20/C in one eye and 20/LXX in the other occurred.

He had seen glaucoma and detachment of the retina in a man of 30, whose right eye had become blind suddenly in childhood, but which had given him no trouble until a few months before, when upon careful examination extensive detachment of the retina was found, this case was treated by eserin, but the outcome is not known.

The cause of the hardening of the globe is yet in doubt. Too much stress has been laid upon the obstruction of the iridic angle and spaces of Fontana. We have cases in which the anterior chamber has been unusually deep, and still the hardness of the eye ball has gone on increasing until sight was destroyed. He had seen one case of congenital absence of the iris and loss of the vision from glaucoma. Iridectomy is the most reliable remedy in a majority of cases, and yet in some chronic cases objections obtain for operative interference. In many of these the sight has been saved for years by eserin in weak solution and massage of the eye ball. Just how an iridectomy benefits a patient we know no more than we did when its illustrious author said: "No progress of importance has been made in respect to the theory of the operation, notwithstanding many attempts. Old hypotheses are usually dragged forth, little as they avail for the explanation of existing facts. The unhappiest of all, the one referring the effect simply to the wound of the ocular capsule, is periodically brought forth, decked in some new formula and recommended for adoption. Fortunately for our patients, practice advances independently on the foundation of empirical principles. No doubt some day a satisfactory theory will be found, but in the meantime we must not be led away by transient hypotheses."

George M. Gould, of Philadelphia, Pa., related a unique experience with a case of glaucoma in an old Quaker lady whom he had seen three years before; after having one eye operated on for glaucoma, the operation being a failure in that the iris was almost completely torn from its

attachment, the pain has been lessened but the tension remains +2 until this day. At the time she visited him the other eye had become hard and she was much frightened and refused to consider an iridectomy on this eye or an enucleation of the bad eye; massage was instituted and she has now perfect vision in the eye last affected. The massage he used as often as the tension goes above normal, the rubbing must be very slow and clear around the outer edge of the eye, great pressure must be made but the movements must not be quick.

J. O. McReynolds, of Dallas, Tex., had seen one case which had been operated on for glaucoma by iridectomy two months previously, but the eye was lost, rendering an enucleation necessary. Repeated attacks of glaucoma occurred in the other eye, but were satisfactorily combatted by massage and repeated instillation of pilocarpin. He warned against the danger of making any kind of an operation upon the eye that is predisposed to glaucoma, as the cocain, the operation, or the mental impression produced upon the patient may have some influence in causing glaucoma. He described a case in which he had seen a patient who was completely blind in both eyes caused from glaucoma; he had lost one from glaucoma and following that, after several months, he had a pterygium removed from the good eye with the result two hours later of an acute, fulminating glaucoma, resulting in complete loss of vision.

J. E. Minney, of Topeka, Kan., had recently seen a case of glaucoma in which iridectomy was refused. The patient was treated by a homœpathic physician who gave five grains of quinin every four hours, curing the patient. He believed this was a case of malarial glaucoma. In one sad case the operation had been delayed until too late, the family physician treating the case by morphin on account of the pain; both eyes had ultimately to be enucleated. If those who teach medical students can only teach them to recognize iritis and glaucoma if nothing else, they will be amply repaid.

C. D. Wescott, of Chicago, Ill., asked if Gould or others who have used massage succeeded in preserving the visual field as well as in these cases. He referred to a patient who had been under treatment for two years by massage whose vision has remained 20/XXX and tension is kept down, but the field has gone on contracting.

G. M. Gould, of Philadelphia, Pa., replied that the field, in the several cases which he had, and especially the ones referred to, remains normal.

J. L. Thompson, of Indianapolis, Ind. Some of his patients treated by massage have gone blind, but so also have some of his iridectomy cases. A

great many cases have been benefited by massage and the field has not been contracted; in spite of any treatment some patients will go blind.

G. C. Savage, of Nashville, Tenn. "*The Field of Fixation or Home of the Guiding Sensation,*" outlined a retinal space which he named as the home of the guiding sensation or the field of binocular fixation. He stated that any test of the ocular muscles is faulty if the image in the eye under test is not thrown entirely outside this field, while the image in the other eye is not displaced at all. He also stated that no phorometer had ever been invented that met these requirements, but that he had in his mind an instrument that would fully accomplish the purpose desired. He strongly emphasized the point that we must not only test the muscle balance, but we must also know what the duction power is in order to be able to do the best work for our patient. The balance test shows us what the heteropic condition is, and the duction test indicates to us what is best to be done in each individual case.

F. B. Tiffany, of Kansas City, Mo., "*Dynamics of the Extrinsic Ocular Muscles.*" His results are based upon the examination of 100 medical students. The examinations were always made with square prisms, and consisted in a careful search into the condition of the extrinsic muscles of the eye. He concludes that we have been in error as to the normal strength of these muscles; that the power has been placed much too high; that the text-books have been misleading, and that subsequent editions should be corrected.

G. C. Savage, of Nashville, Tenn., thought that Tiffany was in error in making a statement that the duction in his cases had been, perhaps, placed too high. He did not state the condition of muscle balance—how a case with no converging power at all, not showing strabismus, can exist and yet not be able to overcome a prism of any extent he does not know. He does not place much dependence upon adduction, as it is so variable; but this is not true concerning abduction, sursumduction or deorsumduction; he believes that 8° is the normal abduction and 3° is the normal sursumduction and deorsumduction.

J. O. McReynolds, of Dallas, Tex. The difference in results obtained by various observers depends much upon the kind of instrument they employ. Tiffany used square prisms in his tests, and this method is not as accurate as that by the phorometer; he uses a phorometer, in which the ordinary appliances of the Stevens phorometer, spirit level, etc., are combined, with two cells containing Risley prisms, so that any degree of prismatic effect may be obtained before any operation is made. We should

now the full amount of muscle power and imbalance, as well as the constitutional condition of the patient.

B. A. Randall, of Philadelphia, Pa., protested against the acceptance of statistics in which so many emmetropic cases are shown, as this condition is almost an unknown quantity. Cases of insufficiency of the recti muscles are frequently resolved into cases of pure hypermetropia; the refraction should be corrected under mydriatics, and until that is done we cannot get true muscle balance.

Geo. M. Gould, of Philadelphia, Pa., commended Randolph's remarks and protested against the remark of Savage, that the question of adduction may be left out of the consideration, as the question of muscle imbalance resolves itself into the proportion between the abduction and adduction and the existence of symptoms. His rule is to correct all ametropia at first, and after that, if the symptoms do not disappear, it is time to work upon the muscles; he is able to relieve all symptoms and develop enough adduction power. He can do nothing with esophoria, and has never seen cases which have been benefited in any way; he has one patient to-day, a minister with 20° of esophoria, who works all day without difficulty when his ametropia is corrected.

J. L. Thompson, of Indianapolis, Ind., said that it was the rarest thing to find an emmetropic individual; he thought that the normal condition of the muscles for distance is 1 or 2 degrees of esophoria; he believes that this is the natural condition for man, as it is natural for the flexor tendons of the hands to be under some tension.

Dr. Sampson. This question is of a great deal of scientific interest, but to most of us who practice medicine the question is, what can we do for the patients? The methods for determining muscle balance are at fault. Speaking of the converging power, faulty adduction is certainly responsible for a great deal of trouble with which we have to deal. School teachers particularly, frequently have exophoria and a converging power not exceeding 10 degrees, while their work requires them to use these muscles, the majority show that other muscles of the body tire easily. An examination of the urine will show the salts run down to a low degree, and it is surprising to see the effects of prescribing quantities of water to be taken or looking after a condition of constipation, for as the general health improves the converging power of the muscles increases.

F. B. Tiffany, of Kansas City, Mo., said that the object of his paper was not to discuss the conditions of heterophoria, but to establish the normal relation of the muscles, and the results of his work correspond with those of Bannister.

C. H. Beard, of Chicago, Ill., "*Recent Experience with Advancement of the Recti Muscles*,"—has tabulated all cases of strabismus occurring in his private practice during the past six years. The total number of strabic cases is 214, or about 4 per cent. of all patients. Paralytic and latent strabismus are excluded. A brief summary of the table is as follows:

142 cases were of the convergent variety.
70 " " " " divergent "
2 " " " " mixed "

Six of the divergent were secondary to tenotomy of interni made to correct convergent strabismus.

Of the 142 cases of convergent strabismus in 74 the left was the squinting eye, 17 alternated and in 51 the right eye turned; in 18 the squint was intermittent when first seen; of the 70 cases of divergent strabismus in 29 the left was the squinting eye, in 26 it was the right and 15 alternated; 10 of them were intermittent.

As to the refraction of the 142 cases of convergent strabismus: Both eyes were hyperopic in 114; both eyes myopic in 6. Anisometropia was present in 2, emmetropia (or practically that) in 20. In the 70 cases of divergence there was hyperopia in both eyes in 38, myopia in both eyes in 16, emmetropia (practically) in both eyes in 11, mixed 2, anisometropia in 3.

In the 114 cases of convergence with hyperopia the latter was three or more diopters in 63. Of the 6 cases of convergence with myopia the error was three or more diopters in 4. Of the 38 cases of divergence with hyperopia, the latter was three or more diopters in 9. Of the 16 cases of divergence with myopia this was three or more diopters in 8. Of the 214 strabic patients 78 were under 15 years, 101 between 15 and 30 and 35 were over 30. There were 125 females and 85 males. Of the total number of cases 158 received some measure of treatment. In many this began and ended with the fitting of a pair of glasses; 56 were not treated, coming merely for examination and consultation. Among the 158 cases treated in some measure 70 had advancement of one or both muscles, the second muscle having been brought forward in about 12 per cent. of the operated cases. The operation was for convergent strabismus in 50 cases and for divergent in 20, in other words, of 81 advancements 57 were of the external rectus and 24 of the internus. Only three of the operations were made in cases of alternating strabismus; of the 70 operated cases just one-half had high degree of amblyopia in the squinting eye with fair to good vision in the fixing eye. Of the rest 13 had 20/XX in both eyes, 13 had 20/XXX in the better eye, and ranged from 20/L to 20/XXX in

the worse—this is the corrected vision; in two the sight was not determined. The vast majority of the patients who had advancement were between 15 and 30 years of age—the years during which good looks are felt to be a necessity.

In thirty-two of the cases treated the strabismus yielded to atropin and glasses, and in nine others to these measures together with persistent systematic orthopic training by means of prisms, the stereoscope, etc. The corrected visual acuity of the forty-one cases corrected by other than surgical means amounted to 20/XX for both eyes in eighteen instances, to 20/XXX in both eyes in fifteen, to 20/L in one, and in three it was not ascertained.

Thus out of the 158 cases to receive some sort of treatment, a cure was accomplished in 111, leaving 47 which are either reporting from time to time, or have wandered off.

J. O. McReynolds, of Dallas, Texas,—"Additional Notes on Employment of Absorbable Sutures in the Operation of Looping the Tendons of Ocular Muscles." The kind of suture material and method employed should vary according to the amount of correction desired. Catgut being used for different forms of heterophoria of moderate degree, the heterophoria being over-corrected to allow for relaxation of the sutures and stretching of newly found adhesions.

Kangaroo tendon being used for extreme heterophoria and in heterotropia because it is not absorbed for two or three weeks; an amount of over-correction proportionate to the tension placed upon the sutures being secured. For small degrees of heterophoria, the conjunctival capsule of Tenon and ocular tendon are grasped firmly with broad fixation forceps, so as to produce a vertical loop of the ocular tendon, and the loop fixed by a single suture passing through it horizontally.

In high degrees of heterophoria and moderate degrees of heterotropia an incision is made along the border of the tendon, and with strabismus hooks the tendon lifted from the sclera, one end of the suture is then introduced beneath the tendon, close in the scleral attachment, the other end beneath the tendon as far from scleral attachment as possible, each needle is carried through the tendon, avoiding the conjunctiva, and the free ends tied, thus fixing the loop of the tendon. The divided conjunctiva is brought together over the loop. Where the degree of deviation is considerable, it is well to precede the advancement of the weaker muscle by a tenotomy of the stronger one.

H. V. Würdemann, of Milwaukee, Wis., said that he had used the Beard form of advancement for about six years, more constantly than any

other advancement operation for heterophoria and for strabismus cases, in which a decided amount of reposition of the recti muscles was needed. The operation is most satisfactory in strabismus cases of more than 15°, for less amounts than this or for heterophoria he preferred one of the minor forms of advancement operations, such as those of Stevens and Savage. As a rule he does not cut off the stump of the tendon as described by Beard, as the laying of one portion of the tendon over the other gives a more accurate hold, as in the healing process we get agglutination, and the small lump is sooner or later absorbed. Immediately after the operation we frequently find that the cornea is partially covered by a large piece of conjunctiva, but this is an advantage, for it lies under the stitch, and is a protection to the cornea; the reaction passes away in seven or eight days, sometimes sooner, then the stitch is removed. Braided silk is the best for this operation. He objected to the use of absorbable sutures in any form of advancement on account of the tendency to relaxation. We endeavor to get in advancement an over effect of 5 or 10°, as this may be readily corrected or disappear. The needles should be very sharp in order to get a good hold on the sclera.

G. Melville Black, of Denver, Colo., demonstrated an operation that he had devised which resembled this one closely. The needle is passed into the sclera, then through the suture above and the same below, making a slight incision on either side of it, then pass the tenotomy hook; the sutures are then passed just from beneath outwards; the muscle is then cut off, the tenotomy hook being removed, the sutures passed through the muscle, and are turned towards the cornea. The muscle is then advanced as far as wished aud sutures tied. The operation may be done in four minutes, and there is scarcely any reaction.

G. C. Savage, of Nashville, Tenn., criticised the Beard operation, as he said it was rather severe for the effect to be accomplished. He agreed with him that in straightening the eyes it is better to do a partial tenotomy of the offending muscle and an advancement of the other than to cut the muscles completely loose from the eyeball. A partial tenotomy ought always to be done in squint, and the rest accomplished by advancement. He preferred the Stevens advancement, the reaction being very slight; he preferred the operation of Black to that of Beard, as it was more simple, secured the same effect, and does not require a general anesthetic. In any operation the less traumatism we preduce in accomplishing our purpose, the less danger there is of infection.

J. E. Minney, of Topeka, Kas., asked if there was any difficulty with

torsion in this operation, and if these muscles are both shortened and advanced.

C. H. Beard, of Chicago, Ill., said that he used to tie the sutures in a bow-knot at first, but found it diffiult to get patients to come back and have the knot adjusted. This is only one of the methods of treating strabismus and he had only used it in cases that did not yield to any other. Thirty or forty degrees of correction might be obtained by this operation; the operation prevents torsion; if the thread be properly inserted the muscle comes forward directly in line with its axis and there is no extra drawing at that point; he never uses a general anesthetic in any of these operations except in cases of little children.

J. O. McReynolds, of Dallas, Tex., said that one of the most important features to his mind was the employment of an absorbable suture instead of silk, because of the difficulty he found to get the silk out of the loop; this was almost as much of an operation as the original one; he considered the kangaroo tendon the best because it is absorbed slowly. By his operation he can secure as much correction as is desired, and if he wishes to get the maximum amount of correction he passes the sutures clear around the cornea to the opposite side.

Under Demonstration of Specimens and new Instruments:

H. V. Würdemann, of Milwaukee, Wis., demonstrated *Preparations of Macroscopic Eye Specimens in Glycerin Jelly.*

Geo. M. Gould, of Philadelphia, Pa., demonstrated: 1. *An Inexpensive Sixty Lens Ophthalmoscope without Rekossa Disk.* 2. *Demonstration of an Autofundoscope.*

Adjournment.

NEWS ITEMS.

Personals and items of interest should be sent to Dr. Frank Allport, 92 State St., Chicago.

By direction of the Kultus minister (Germany), Professor Kuhnt, director of the Königsberg University Eye Klinik, has gone to Egypt and Palestine for the purpose of studying there the contagious diseases of the eye. The mission has reference to the increasing prevalence of such diseases, particularly of trachoma in east Prussia.—*Ann. Oph.*

Dr. M. Peschel has been appointed a. o. Professor of Ophthalmology to the University of Turin.—*Ann. Oph.*

Professor Silex of Berlin has given up his position as assistant in the University, to devote himself to his just established private clinic.—*Ann. Oph.*

The British Ophthalmological Society.—At the meeting of this society, held on July 8th, the following officers were elected: President, H. R. Swanzy; Vice-Presidents, Sir W. R. Gowers, Drs. Argyll Robertson, R. Marcus Gunn, R. Williams, E. Nettleship, Henry Eales, W. A. Brailey, Priestley Smith, F. R. Cross, and George Cowell; Treasurer, Dr. John Abercrombie; Secretaries, Dr. James Taylor and E. Treacher Collins; Librarian, W. Adams Frost.—*N. Y. Med. Record.*

A reorganization of the Louisville Medical College has been brought about, and Dr. William Cheatham of Louisville, Ky., has been given the Chair of Ophthalmology, Otology and Laryngology. Dr. Cheatham is thoroughly qualified to occupy this position, and his many friends are pleased that the Louisville Medical College has deemed it to their advantage to invite him to an honored place in the faculty.

The total number of blind in the United States is nearly 49,000, or 976 in each million of the population. The number of blind reported as receiving instruction is 4,691. The number of blind who are also deaf mutes is: Whites, 84 males and 107 females; colored, 28 males and 29

females. Blind and idiotic: Whites, 595 males and 463 females; colored, 66 males and 62 females.—*N. Y. Med. Record.*

THE CURE of glaucoma by resection of the superior cervical sympathetic ganglia is reported by Jonnesco, who has performed the operation seven times for this purpose and found the improvement marked and progressive, even in cases that had resisted iridectomy.—*Presse Méd., June 8.*

ONE OF the collaborators of the OPHTHALMIC RECORD, Dr. Edwin Van Millingen of Constantinople, Turkey, has, by order of the Sultan, been appointed Professor of Ophthalmology in the Imperial Military School of Medicine at Constantinople. Dr. Van Millingen is well known as being very proficient in his profession, and the appointment of a man of his caliber in a medical school in Turkey should mean much for the advancement of ophthalmology in that uncivilized monarchy.

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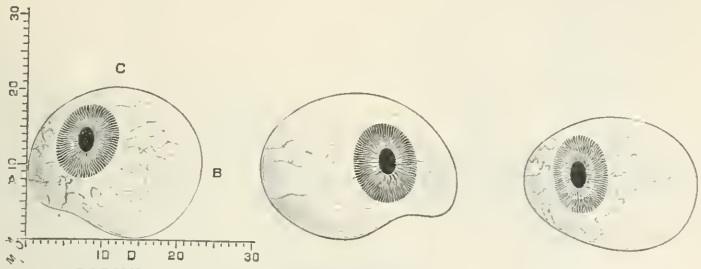

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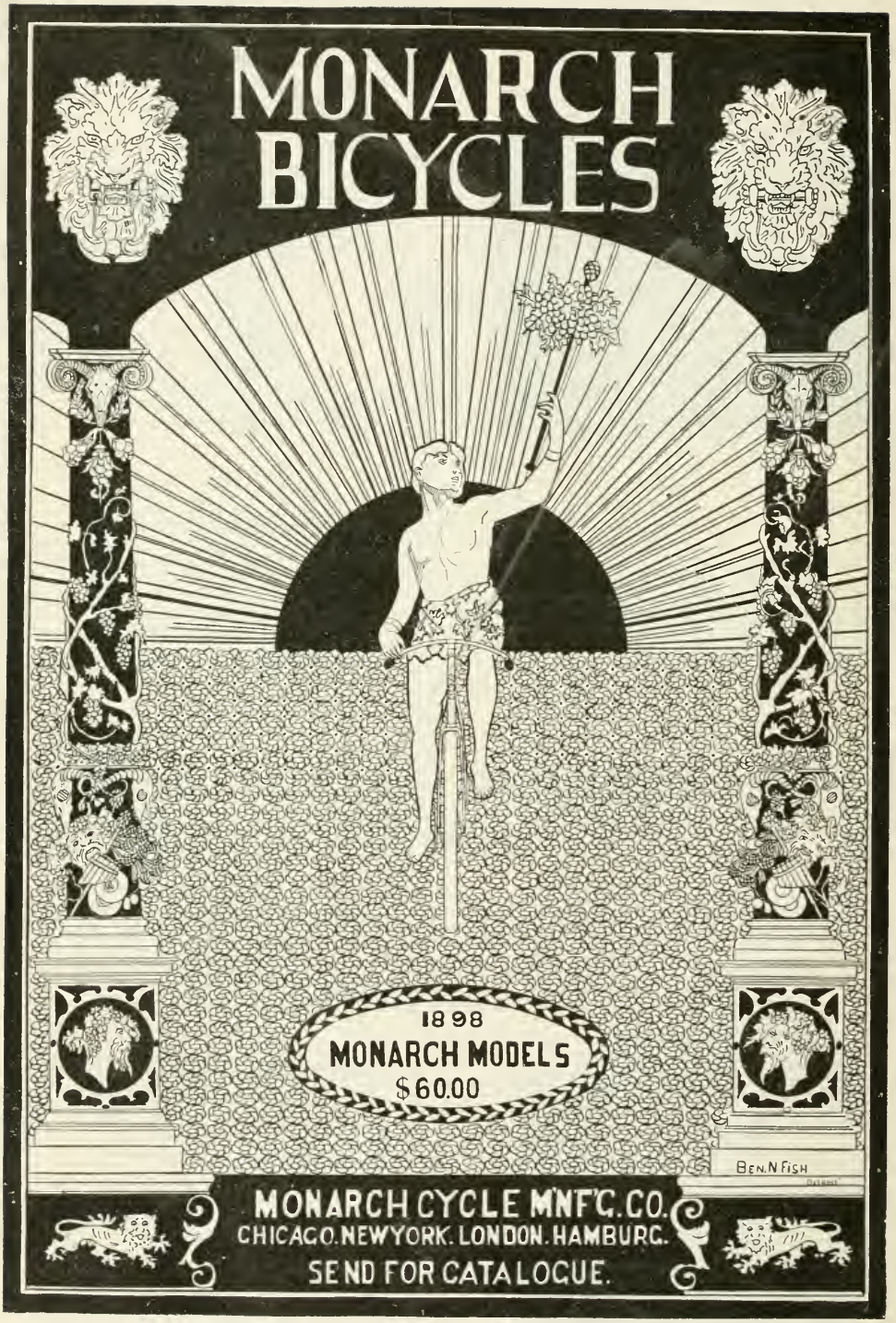
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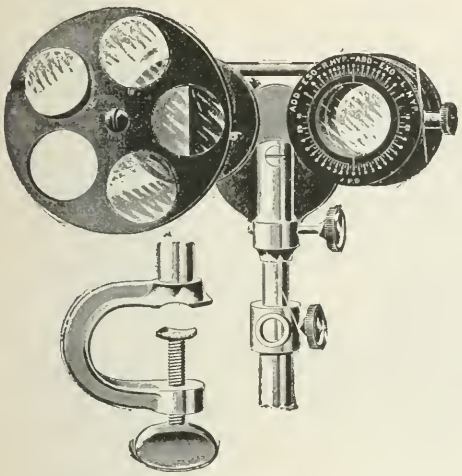

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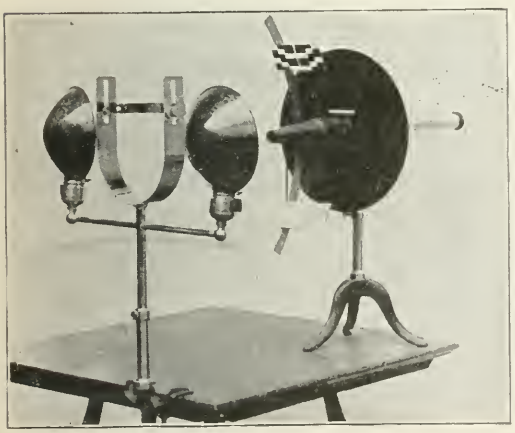

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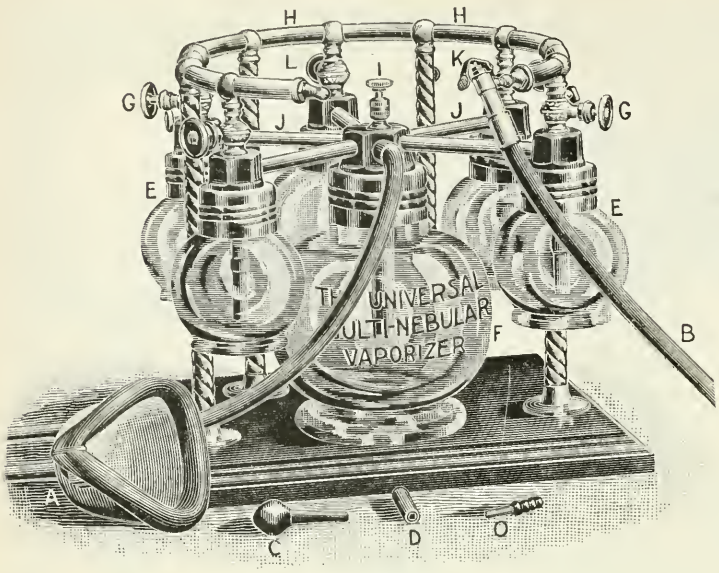

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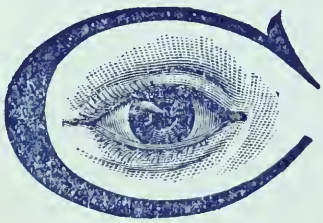
TRADE  MARK

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